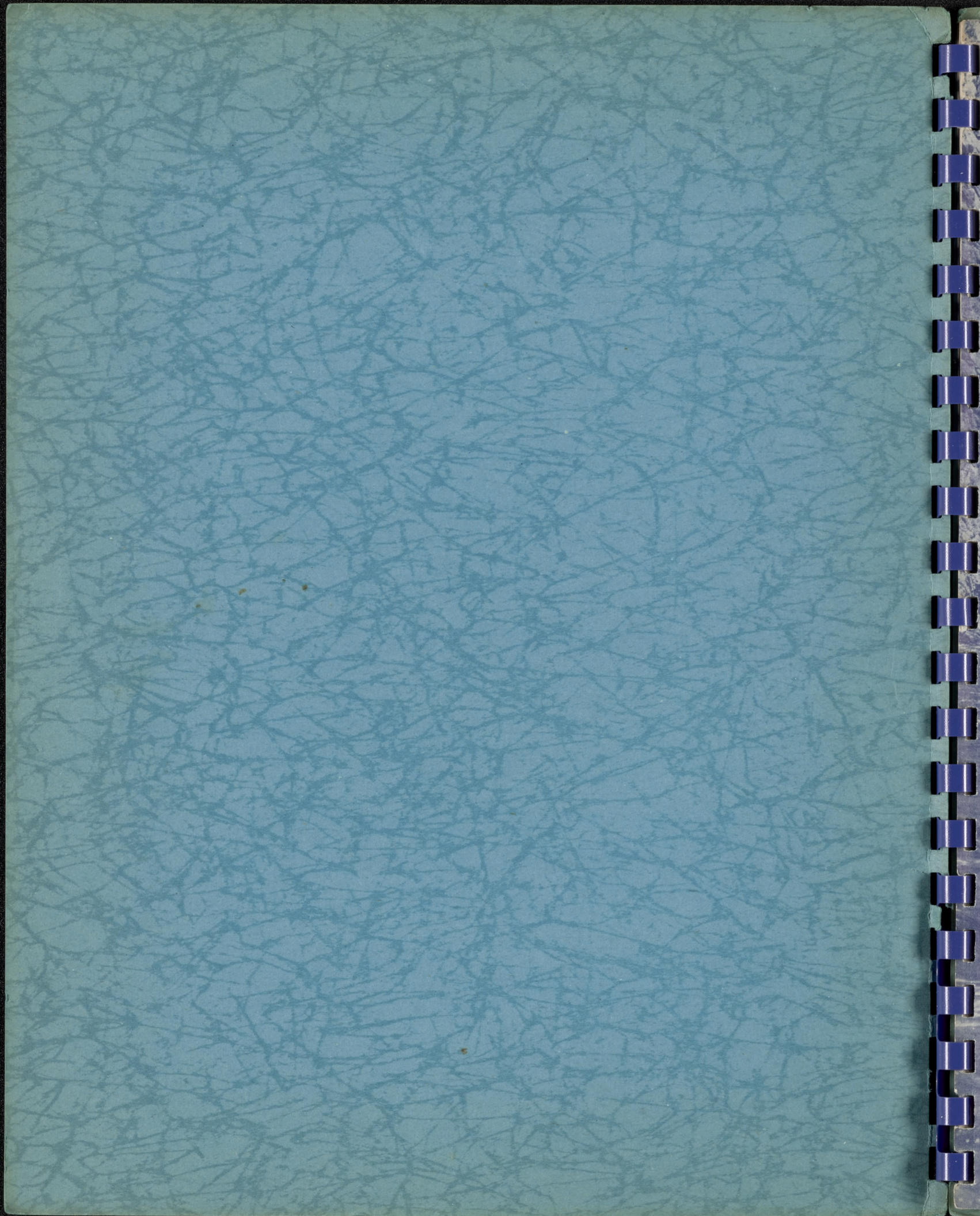
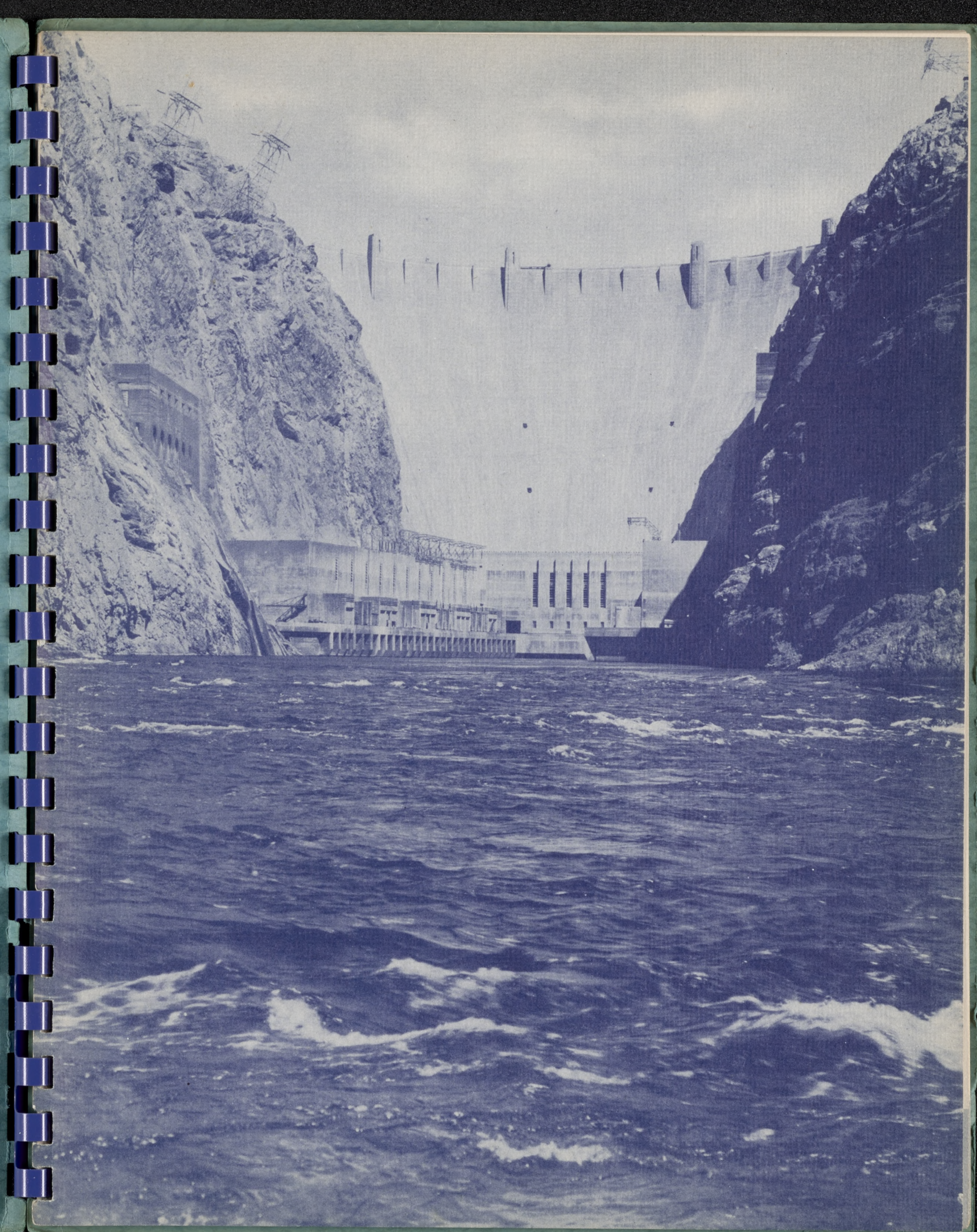


*San Diego's Quest
for Water*

W. P. WHITSETT





The Metropolitan Water District of Southern California

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Secretary A. H. Allen

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Santa Monica Samuel J. Crawford
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* Victor H. Rossetti resigned as Board Chairman on November 14, 1947, and his successor had not been elected when this publication went to press.

San Diego County Water Authority

A CONSTITUENT AREA OF THE METROPOLITAN WATER DISTRICT

Chairman Fred A. Heilbron
Vice Chairman Arthur L. Lynds
Secretary W. H. Jennings

Treasurer Walter B. Whitcomb
Controller Charles L. Royer
Executive Secretary E. L. Longfellow

MEMBER AGENCIES AND REPRESENTATIVES

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Fallbrook Public Utility District E. J. Schmitz
Lakeside Irrigation District A. G. Mitchell
La Mesa, Lemon Grove & Spring
Valley Irrigation District W. H. Jennings
National City Del Dickson

Oceanside Harold N. Beck
San Diego Fred A. Heilbron
San Diego Arthur H. Marston
San Diego Fred W. Simpson
San Diego Walter B. Whitcomb

Frontispiece: HOOVER DAM . . . San Diego Has Extended Its Water Life Line to the Colorado.

1769



San Diego's Quest for Water

FOREWORD

Few communities have faced the difficulties with which San Diego has had to contend in developing a water supply, and none has met them with more courage and determination.

It is a far cry from the first primitive irrigation ditch, wells and stone dam built by the Franciscan Fathers after they planted the flag of civilization here in 1769, to the great Aqueduct of 1947. But the same instinct of present and future security dominated both endeavors.

To the pioneering Padres, the scant supply conserved from the San Diego River was as important as the abundant flow of Colorado River water is to the people of metropolitan San Diego and its environs.

In the stretch of years between the early Mission times and today, WATER has been the uppermost problem confronting the community. Fortunately, in each of the numerous crises that arose, there always was a resolute civic leadership that met the immediate situation, and planned ahead.

Of the successive steps, each greater than the one before, taken by the community to further its development, the arrival of Colorado River water via the San Diego Aqueduct ranks as the crowning achievement. However, it is just another important step in the never-ending struggle to provide an adequate supply not only for the times at hand but for the Greater San Diego of tomorrow.

To all of the men and women of vision who through the years have so faithfully served their community in meeting its No. 1 problem, the booklet, "San Diego's Quest For Water," is respectfully dedicated.



1947

The Saga of Water Development

From Crude Dam to \$110,000,000 Investment

Parched lands of a semi-arid region greeted the first white men who stepped ashore in 1542 at what is now San Diego. Were Juan Rodriguez Cabrillo and his band to return today they would gaze in bewilderment at the thriving metropolis, and perhaps think they had chanced upon one of the Southwest's fabled Seven Cities of Cibola.

When Junipero Serra and his followers set foot in 1769, there was before them the same barren country that Cabrillo had glimpsed. But where the latter had tarried only long enough to make an entry in his explorer's log and be on his way, the Franciscans came as



the vanguard of Christianity. To their determination to spread civilization, and develop the area, is due the transformation that has taken place in the 178 years that have elapsed.

Much has been written about the Franciscans' tribulations in a land whose natives were hostile and whose resources appeared negligible. Always there is reference to their persistent efforts to secure water.

WATER!

Down through the years, this has been San Diego County's most formidable challenge. It has overshadowed all of the other complexities that accompany sturdy community growth.



Succeeding generations inherited the problem and each met it in a way to satisfy the immediate, intensive need, until just before the turn of the century when San Diego began earnestly to plan ahead.

In the interim there were times when water from the River sands near Old Town was carted laboriously to thirsty citizens and peddled for 25 cents a bucket. Later wells were sunk and storage tanks built, the water being pumped by windmills. Commenting on this development in 1874, the Chamber of Commerce announced:

"There is sufficient water to meet the demands of the population when San Diego has

1769





grown to be a large city," and again, "The San Diego Water Co. . . . has solved the problem satisfactorily. Their wells are now completed and they are prepared to supply good artesian water in unlimited quantity."

Then there was the 7-year period of the Great Drought that started in 1897, when scarcely enough water could be had for human consumption.

Development of New Town, now San Diego, started in 1850, and it was then that the importance of water began to dawn upon the civic leadership.

The first faltering but ambitious step in planned water development came with the

organization of the San Diego Water Co., in 1873, when the population was about 2,000. From a well sunk in Pound Canyon, near Eleventh Ave. and A St., 50,000 gallons were pumped daily into two nearby reservoirs and piped to the immediate area.

In 1886, when the population had jumped to 30,000 with the extension of the Santa Fe Railway to San Diego a year earlier, the next important advance was recorded in the formation of the San Diego Flume Co. Its backers were the first of the groups that in succeeding years realized that water in sufficient quantities to meet the requirements of the growing City could be obtained only by developing a supply in the mountains.

Ignoring the ridicule of short-sighted townsmen, they built Cuyamaca Dam. An adjunct was a 31-mile flume down which civic leaders and distinguished visitors rode in boats on dedication day, Feb. 22, 1889.

The boom period resulting from real estate speculation that accompanied advent of the railroad was approaching its end but the water fever spread,

and several companies were formed. Out of the ensuing struggle for supremacy, only the Flume Company and the Southern California Mountain Water Co. survived. The latter, organized by E. S. Babcock and John D. and Adolph B. Spreckels in 1895, started construction of Morena Dam and Lower Otay Dam that year, and Upper Otay Dam three years later. The Flume Company, beset by financial troubles and stiff competition, eventually was acquired by Ed Fletcher, a pioneer in county water development, and James A. Murray, in 1910.

The City purchased the San Diego Water Co. holdings within the corporate limits in 1901. This was the humble beginning of a

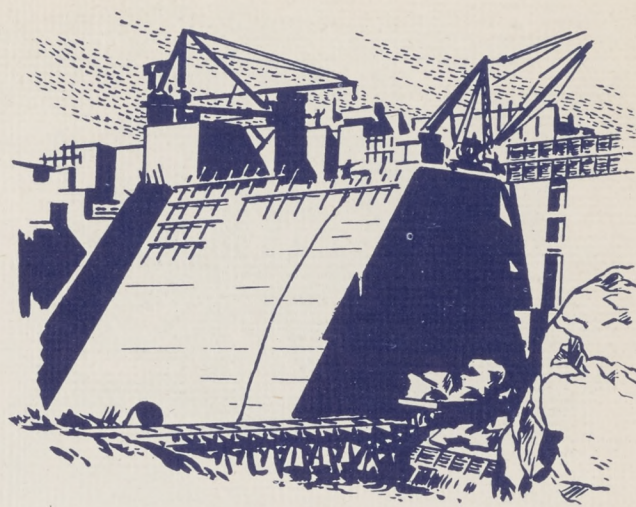


1947

step-by-step program of municipal ownership that by 1947 included dams, water rights, distribution lines and other facilities representing a community investment of \$40,000,000.

This over-all water development program unfolded in four phases.

The first major water acquisitions were the Lower Otay and Upper Otay projects of the Southern California Mountain Water Co., in 1913, and Morena Dam, in 1914. The Otays, and other holdings, were purchased through a \$2,500,000 bond issue voted in 1912; a \$1,500,000 bond issue then was voted for Morena. These comprised the Cottonwood-Otay system, to which was added Barrett Dam, built by the City in 1921-1923.



Lower Otay, destroyed by the flood of 1916, was replaced by the present larger dam in 1918-19. Its construction was supervised by the late Hiram N. Savage, City Hydraulic Engineer, who also planned and supervised construction of Barrett and El Capitan Dams.

Next, the City looked to the north where the San Dieguito Mutual Water Co., named after the river whose water it conserved, had built Hodges Dam and the smaller San Dieguito Dam in 1917-18. This system was acquired in 1925 under a purchase contract, which was refinanced in 1939 through the voting of a bond issue, at a substantial ultimate saving to taxpayers.

Development of the San Diego River, long foreseen, took form in 1924 when a bond issue of \$4,500,000 was voted for El Capitan Dam and pipeline. However, work was delayed by litigation to determine the City's paramount rights to all the waters in the River. The State Supreme Court decided in the City's favor June 20, 1929, and refused, March 31, 1930, a rehearing sought



by the opposition. On Oct. 13 of the same year, the U. S. Federal Court refused to take any action. Thus the way was cleared for the El Capitan project, on which work was started in 1932 and completed in 1935.

The newest unit of the municipal system, San Vicente, for which \$3,000,000 in bonds were voted in 1940, was started in 1941 and completed two years later.

The fourth and present phase—and the most significant—centers in the Colorado River whence San Diego and six other member agencies of the San Diego County Water Authority now receive a timely supplemental supply via the just-completed Aqueduct.





Contrary to a belief held in many quarters, the advent of Colorado River water is not the final solution of San Diego County's No. 1 problem. Those whose experience qualifies them to speak say that if the growth of the area continues at its present rate, it will become necessary to double the capacity of the Aqueduct by constructing a second tube; also to further develop all local sources of supply.

Completion of the Aqueduct is the result of years of "looking ahead." This period began as long ago as 1919, when there first was evidenced an awareness of the Colorado River as a potential source of future supply. This am-

bitious program unfolded in successive stages that included establishing water rights in the Colorado, formation of the Water Authority, assuming the obligation of financing the Navy-built Aqueduct, and affiliation with The Metropolitan Water District.

San Diego and its contiguous area always has had to get water the hard way. This fourth phase has been difficult to achieve—costly in terms of dollars, but economical from the standpoint of necessity. It represents an investment, over a long period, of between \$60,000,000 and \$70,000,000, in addition to the \$40,000,000 "water insurance" policy taken out by the City.

Beyond that, the delivery of Colorado River water represents the collective thinking, planning and teamwork of civic leaders and groups for more than a generation; and above all, an expanded community outlook that envisioned a source, far beyond the County's borders, destined to protect the future growth of both San Diego and its back country.

Related elsewhere in this booklet are the successive steps taken, and the problems overcome, in attaining the community's greatest achievement up to the present.

The quest for water began in the days of the Padres nearly two centuries ago. It has continued through the years, and will demand tomorrow the same far-sighted leadership possessed by a fortunate San Diego yesterday and today.



1947

Water Authority

Second Largest Agency in Metropolitan Water District

Primarily to import Colorado River water, the San Diego County Water Authority was incorporated under a State Legislature enabling act June 9, 1944, with a membership of five cities, three irrigation districts and one public utility.

Organization of the Authority did not mark the beginning of a new project, but rather the final step toward a goal for which many men

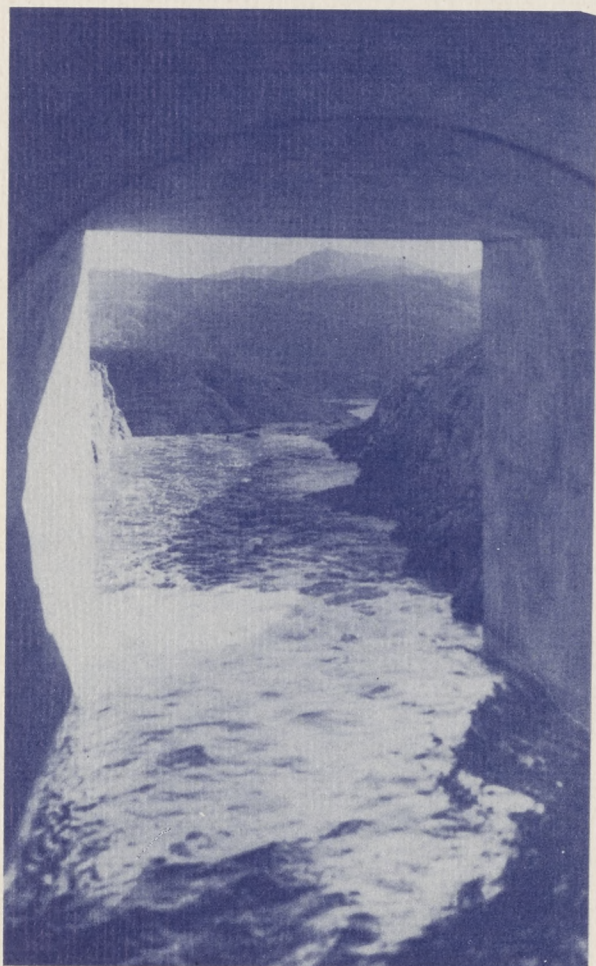
with vision and foresight had labored during preceding decades. The objective of these early endeavors, which at that time seemed remote, now is being realized with the delivery of Colorado River Water to San Diego County.

The original membership included the cities of Chula Vista, Coronado, National City, Oceanside and San Diego; Fallbrook Public Utility District, Lakeside Irrigation District, Ramona Irrigation District and La Mesa, Lemon Grove & Spring Valley Irrigation District.

Coronado withdrew its membership in May, 1946, since that city's present resources were declared adequate to meet all future demand due to its limited area for expansion. Ramona Irrigation District withdrew in August, 1946, because of the prohibitive costs of transporting Colorado River water to that area.

When the original 12-man board of directors met July 15, 1944, Fred A. Heilbron, long a leader in San Diego's "Quest for Water," was named Chairman. George V. Johnson, National City, became Vice-Chairman; W. H. Jennings, La Mesa, Secretary; Walter B. Whitcomb, San Diego, Treasurer; George F. Neal, Coronado, Controller. Arthur L. Lynds, Chula Vista, was later named Assistant Controller, and A. G. Mitchell, of Lakeside, became Controller when Coronado withdrew from the Authority. Mr. Johnson resigned in August, 1947, and was succeeded by Del Dickson, with Mr. Lynds stepping into the Vice-Chairmanship.

San Diego's need for Colorado River water as already described dictated the need for a County Water Authority. It obviously was impossible for the County to take over the project because it lacked legal authority. Also it would have been unfair to tax the entire County for facilities to be used by only certain portions. It likewise was impossible for the City of San Diego to assume full responsibility and sell to other agencies within the County.



SAN VICENTE TUNNEL OUTLET from which Colorado River water flows into San Vicente Reservoir.



Water Authority...

Board of Directors



W. H. Jennings
Secretary
La Mesa, Lemon Grove
& Spring Valley Irrigation
District



Fred A. Heilbron
Chairman
San Diego



Arthur L. Lynds
Vice Chairman
Chula Vista



Arthur H. Marston
Director
San Diego



Walter B. Whitcomb
Treasurer
San Diego



Harold N. Beck
Director
Oceanside



Fred W. Simpson
Director
San Diego



Del Dickson
Director
National City



E. J. Schmitz
Director
Fallbrook Public
Utility District



Phil D. Swing
General Counsel



J. L. Burkholder
General Manager and
Chief Engineer



Allen G. Mitchell
Director
Lakeside Irrigation
District



1947



Concrete hopper at inlet portal, San Vicente Tunnel

The answer was a separate Water Authority, empowered to acquire water rights outside the County, and to develop, store, transport, and deliver such water at wholesale to its member agencies.

With San Diego City and County officials and a group of Civic leaders backing the establishment of such an Authority, Senator Ed Fletcher introduced a bill in the State Legislature known as the County Water Authority Act, signed by Gov. Earl Warren, May 17, 1943.

Merging of the City or County water interests with those of The Metropolitan Water District of Southern California had been discussed, and negotiations had been started and stopped as early as 1928. First, Hiram N. Savage, City Hydraulic Engineer, and later R. W. Flack, City Manager, had dealt with leaders of the District regarding terms and methods of annexation. These had been dropped when the City chose to favor bringing its Colorado River water from the All-American Canal at a point above Imperial Dam.

But when Federal agencies designated the Navy to build the San Jacinto-San Vicente Aqueduct (now the San Diego Aqueduct) because of the greater speed with which this facility could be constructed, it became necessary to annex the Authority to the Metropolitan District to insure permanent flow of Colorado River water to San Diego from the District's Colorado River Aqueduct.

Thus the immediate task of the newly created Authority was to negotiate with Metropolitan District officials for terms under which the Authority could be annexed to the District.

In his letter authorizing construction of the aqueduct as a war emergency measure, President Roosevelt stated, "I have asked the San Diego County Water Authority and the City of San Diego to press negotiations with the Metropolitan Water District of Southern California in order that an equitable arrangement may be completed for the permanent operation of the works which will have continued value and utility."

City, County, and Water Authority leaders already had started these negotiations, with the late City Manager, Walter Cooper, taking the lead. Mr. Cooper's untimely death in an airplane accident December 1, 1944, caused a delay in resuming negotiations, but they were started again in March, 1945, with Mayor Harley Knox and a committee from the Water Authority Board assuming leadership. This committee consisted of Chairman Heilbron, Secretary Jennings, Vice-Chairman Johnson, H. N. Beck, of Oceanside, and the Authority's General Manager and Chief Engineer, J. L. Burkholder.

City Manager Fred Rhodes, Assistant City Manager G. E. Arnold, and Hydraulic Engineer Fred D. Pyle, represented the City.

The terms, as finally worked out, involved



merging the Colorado River water rights of San Diego City and County with those of the M.W.D.; payment of a special tax equal to the amount the Authority would have paid had this area been a part of the Metropolitan Water District since its formation (to be paid over a 30-year period without interest); the District to assume title to northern half of San Diego Aqueduct and pay half the cost of the aqueduct's construction; the District to be responsible for enlarging the northerly half of the aqueduct whenever increased capacity is required.

This agreement was approved overwhelmingly by voters in the areas served by the Authority's member agencies, and the annexation was effected in November, 1946.

This makes the San Diego County Water Authority, which includes about 80 per cent of the population and assessed valuation of San Diego County, the second largest agency in the Metropolitan Water District. Its two representatives on the District's Board—Fred Heilbron and Joseph L. Burkholder—cast 27 of the total 188 votes.

To distribute the water to member agencies of the Authority, voters also authorized the Authority to raise \$2,000,000 through a bond issue. This fund is paying for construction of about 33 miles of additional pipe line in the Oceanside-Fallbrook and La Mesa-Sweetwater extensions.

Deliveries to Lakeside Irrigation District, La Mesa, Lemon Grove & Spring Valley Irrigation District, National City and Chula Vista will be made upon completion of the Sweetwater extension, about April 1, 1948.

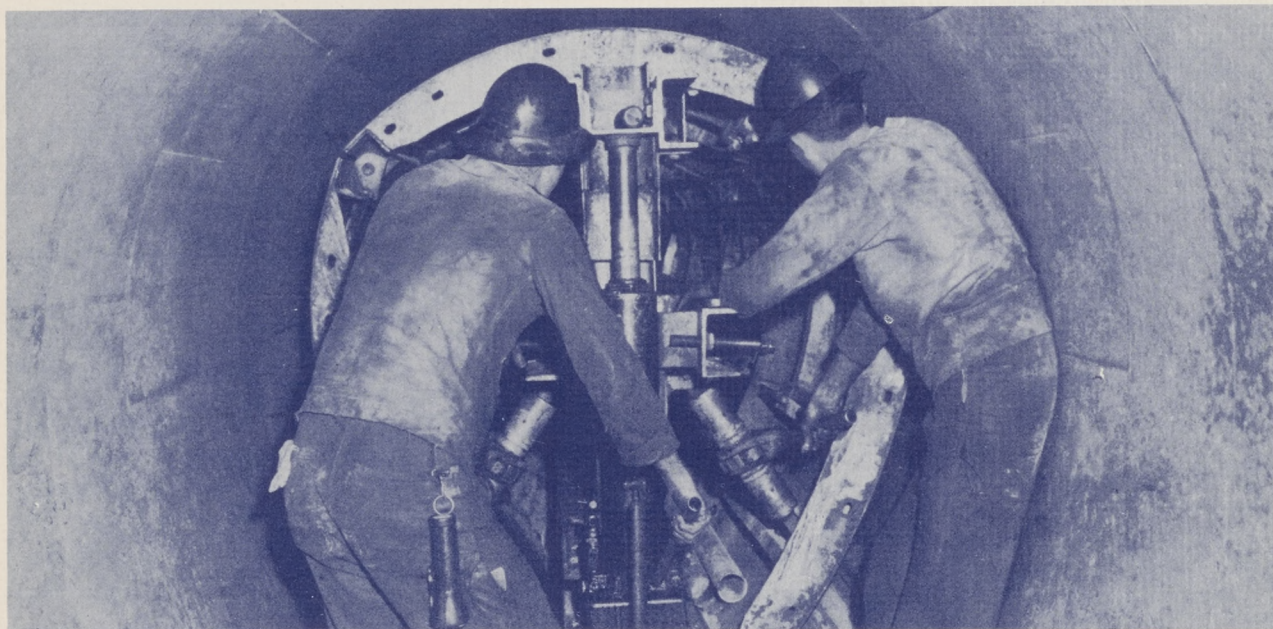
Through arrangements with the California Water and Telephone Company, National City and Chula Vista will store their water in Sweetwater reservoir, while the two irrigation districts will draw their water from the line en route.

Starting with 39-inch pipe at San Diego Aqueduct, the line tapers along its 16½-mile route to 18 inches at Sweetwater, with a total capacity of 22.6 million gallons per day. The total construction cost is estimated at \$1,300,000.

Completion of the Oceanside-Fallbrook branch line is expected August 1, 1948. This branch will tie into existing lines at Oceanside Wells, with a total of 5.2 million gallons per day as the capacity for both Oceanside and the Fallbrook Public Utility District.

This line is being constructed of 16-inch pipe to Fallbrook and 14-inch on to Oceanside Wells, at a total cost of \$700,000.

Individual members of the Authority are assuming costs of any additional construction work required to make full use of the new water supply, such as San Diego's projected erection of a large water treatment plant.



Removing collapsed arch forms in Fire Hill Tunnel



1947



James Forrestal,
Secretary
for Defense.

The Navy's Part

in San Diego's Water Development

Though San Diego had been following a well planned program for the development of its water resources to keep step with its normal increase in population, the severe impact of the war effort on San Diego and vicinity necessitated immediate construction of facilities to obtain water from the Colorado River—a project envisioned for many years but not contemplated before 1960.

The capacity of the system of dams and impounding reservoirs in the higher country and pumping plants taking water from sands in the lower valleys had been built up to a net safe yield of 26.6 million gallons per day. This was adequate to serve the 1940 population of 202,000, and the San Vicente Dam and Reservoir was to add another 5.3 million gallons per day, sufficient for an estimated 1950 population of 260,000.

When the European war started in 1939, however, San Diego became a center of military and naval expansion and for manufacture of aircraft. Population passed the 1950 estimate in 1942, and reached 362,000 in 1946, exclusive of the increased military personnel.

Effect of this growth on water deliveries is shown in the rise from 23.9 million gallons per day in 1941 to an average of 49.6 million gallons per day in 1946, dropping to 44.8 in 1947. Even more significant is the tremendous increase of water used by U.S. Government agencies in this period, rising from 11.3 percent of total water consumption in 1941 to 41.5 percent in 1946, and dropping only to 30.1 percent in 1947.

Recognizing that the 300 million dollars invested in Navy establishments in and near San Diego had developed the nation's great permanent training and operating center for ships and planes of the Pacific Fleet, Navy leaders in San Diego and Washington observed



Admiral Ben Moreell,
(CEC) USN.



Rear Admiral
W. L. Friedell, USN.



Vice Admiral
J. B. Oldendorf, USN.



Rear Admiral
Oscar C. Badger, USN.

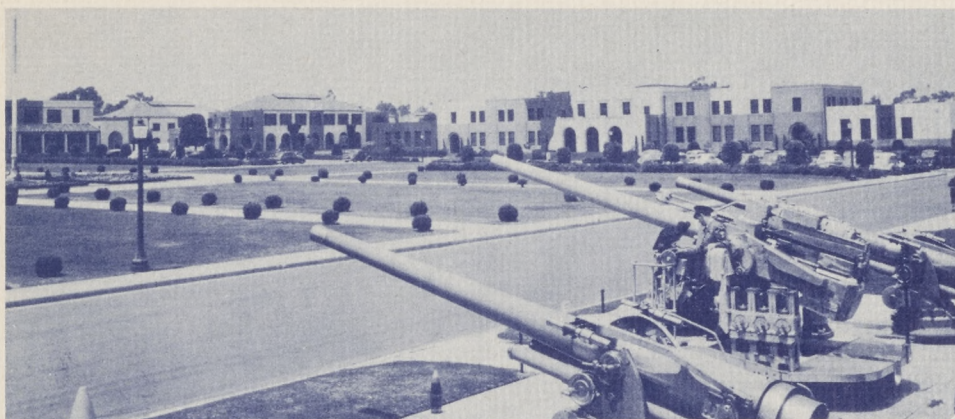


Captain A. K. Fogg,
(CEC) USN.



Rear Admiral
John J. Manning,
(CEC) USN.





**Scene at huge
Naval Training Center,
San Diego.**

the drain these activities were exerting on the city's limited water supply and noted that failure of the city's water resources would render the entire Naval establishment valueless.

Rear Admiral W. L. Friedell, USN, Eleventh Naval District Commandant, and Captain Alden K. Fogg, (CEC) USN, District Public Works Officer, led in making a strong appeal to Navy officials in Washington to press for federal funds to obtain Colorado River water at the earliest possible time.

Admiral Ben Moreell, (CEC) USN, Chief of the Bureau of Yards and Docks, and Secretary of Navy James Forrestal carried the appeal in Washington, with active support from Senator Sheridan Downey of California.

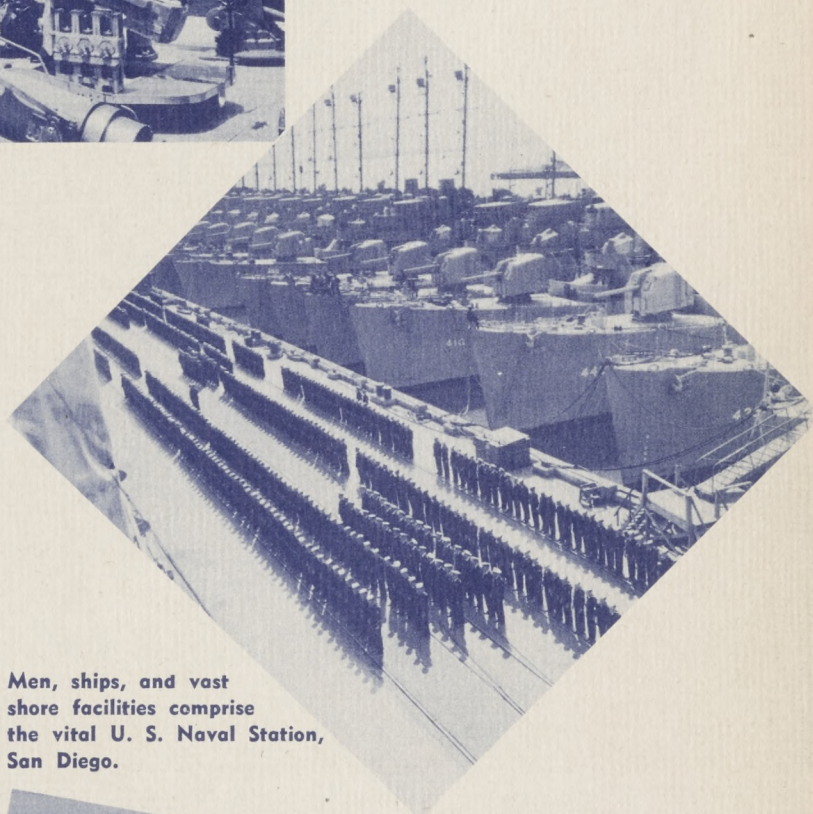
These actions resulted in the appointment by President Roosevelt of an inter-departmental committee to make a study, report and recommendations to him on the project. The members of the committee were:

William E. Warne, Assistant Commissioner, Bureau of Reclamation, Chairman;

Admiral Ben Moreell, Navy Department;

Major General Eugene Reybold, Chief of Engineers, War Department;

Baird Snyder, Assistant Administrator, Federal Works Agency;



**Men, ships, and vast
shore facilities comprise
the vital U. S. Naval Station,
San Diego.**

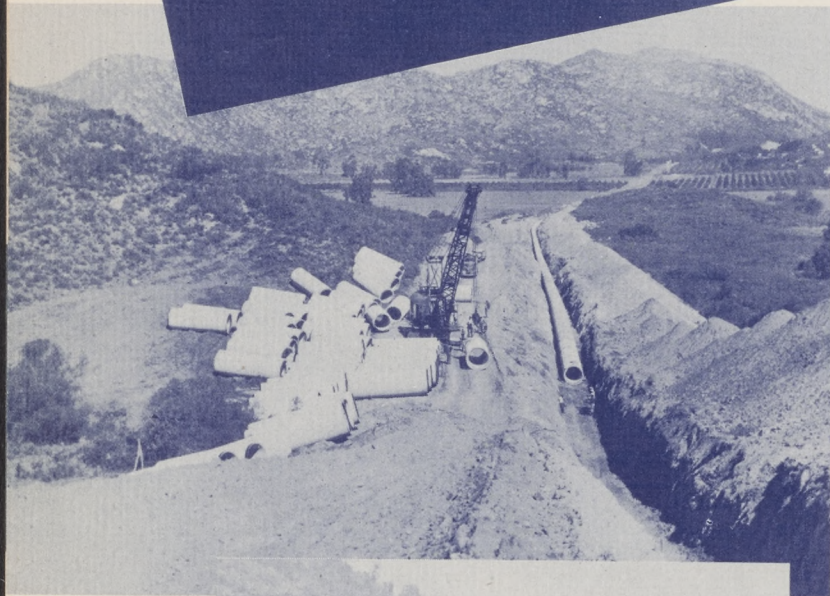


**Administrative area,
U. S. Naval Air Station,
North Island, San Diego.**



1947

Through mountain
tunnels . . .



Across
valleys . . .



And over the hills, comes
precious water for San Diego.

Phil D. Swing, Attorney, San Diego County Water Authority.

This committee's report submitted in October, 1944, declared: That an emergency did indeed impend in the water supply of San Diego and surrounding communities;

That the Colorado River offered the only available source from which an adequate and dependable supplemental water supply could be obtained;

That the route via the aqueduct of The Metropolitan Water District of Southern California was preferable to the All-American Canal route in that it would be a gravity system requiring a minimum of critical materials and could be completed within two years;

That the construction of the aqueduct as an emergency measure should provide for a capacity of 50,000,000 gallons per day and that tunnels should be built to the full ultimate size of 100,000,000 gallons per day; and that the project should be financed 100% by the Federal Government as a measure to safeguard water supplies to Federal activities.

The President approved the report on Nov. 29, 1944, designating the Bureau of Reclamation to prepare plans and specifications, and the Navy's Bureau of Yards and Docks to perform the construction work.

With prompt survey work by the Bureau of Reclamation, the Navy was able to advertise the first portion of the work for bids to be opened April 4, 1945, this being for construction of three of the seven tunnels. Other sections followed as rapidly as surveys could be completed and plans and specifications prepared, with bids for the final section being opened October 24, 1945.

Meanwhile, the war had ended and effort was being made to terminate contracts. Notice was served on the City by the Navy Department that this emergency project would be cancelled. But the water situation had gotten progressively worse, and both the City and Navy leaders here felt that the work must continue if a dire water shortage was to be averted.





Winding 48-inch concrete pipe through rugged terrain.

Vice Admiral J. B. Oldendorf, USN, successor to Rear Admiral Friedell as District Commandant, and Captain Fogg joined with city officials in protesting the decision to cancel the project. In Washington, their stand was supported by Admiral Moreell, and by Rear Admiral J. J. Manning, (CEC) USN, who later succeeded him.

After extended negotiations, a contract was consummated between the City of San Diego and the Navy Department whereby the Navy agreed to complete the construction and the City agreed to reimburse the Government at the rate of \$500,000 per year until the project was paid for, exclusive of interest.

The overall cost of the entire project is estimated as follows:

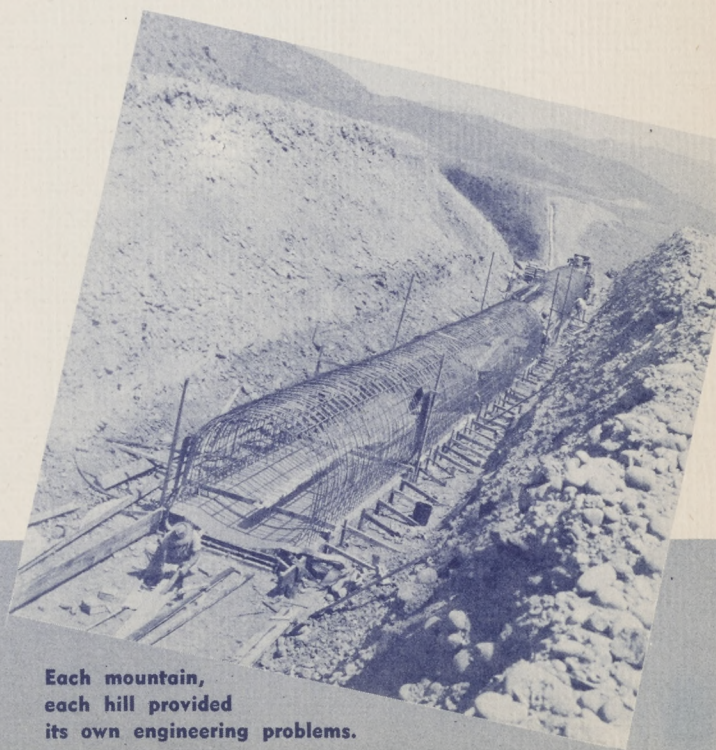
Direct contract costs	\$12,530,000
Land acquisition	250,000
Navy administration and engineering	800,000
Bureau of Reclamation costs . .	250,000
Contingencies	350,000

TOTAL \$14,180,000

The project was completed under Rear Admiral Oscar C. Badger, USN, who relieved Vice Admiral Oldendorf as District Commandant. The entire project was supervised by Captain Fogg, with Commander R. D. Thorson, (CEC) USN, as Resident Officer in Charge.



Front, left to right: A. J. Forman, Senior Engineer; Lt. Comdr. F. M. Hines, Central Division ROINC; O. H. Lillard, Office Engineer; Standing—Lt. D. A. Gray, Southern Division ROINC; Comdr. R. D. Thorson, Resident Officer-in-Charge.



Each mountain, each hill provided its own engineering problems.



1947

Acquisition of Aqueduct...

Leadership Saves San Diego's Greatest Water Project

Spurred to action by threatened Navy cancellation of the Aqueduct construction, united efforts by San Diego civic leaders and representatives, backed by Eleventh Naval District officials, prevented abandonment of the only project capable of averting an impending water crisis.

At the end of World War II, a stringent curtailment of operating funds faced the Navy. Scores of emergency construction projects already under way were cancelled, and the San Diego Aqueduct was included in that list.

Because of the crisis, a delegation of City and San Diego County Water Authority representatives flew to Washington, D. C., and in a few days negotiated a contract with the office of the Secretary of the Navy which prevented interruption of the work. The delegation consisted of Charles C. Dail, Vice Mayor; G. E. Arnold, Assistant City Manager; Fred D. Pyle, City Hydraulic Engineer; Fred A. Heilbron, Chairman, and J. L. Burkholder, General Manager and Chief Engineer, of the Water Authority.



Fred A. Rhodes
City Manager



Harley E. Knox
Mayor



Sheridan Downey
United States Senator

Following telephone conversations with Mayor Harley E. Knox and other City officials, the Mayor hurriedly summoned civic leaders to confer with the City Council relative to terms outlined by the Secretary of the Navy for continuing work on the Aqueduct. Decision was unanimous to enter into such a contract as the only way to prevent stoppage of construction and a consequent water shortage.



Accordingly, Fred A. Rhodes, City Manager, and Jean F. DuPaul, City Attorney, were instructed to proceed immediately to Washington, where they approved the contract, which was signed Oct. 17, 1945, by Mr. Rhodes under authorization of the City Council.

The contract provided that the Navy would complete the project as originally planned, and that the City would reimburse the Government for costs of construction by annual installments of \$500,000 until the actual cost was repaid without interest.

This brought to a conclusion nearly two and one-half years of constant efforts on the part of City representatives to impress Washington with the urgent need for action. To the late Walter W. Cooper, City Manager, is due much of the credit for laying a sound foundation for San Diego's subsequent success in winning approval of the Aqueduct project.

At an election November 5, 1946, the City was authorized to assign its major rights and obligations under the lease-purchase contract to the San Diego County Water Authority, and the contract was revised to comply with that provision.

This arrangement had been made possible



Charles K. Fletcher
Congressman,
23rd District

Fred D. Pyle
City Hydraulic
Engineer



William F. Knowland
United States Senator



G. E. Arnold
City Water Director



by concurrent action by City voters authorizing the merging of the City and/or County water rights with those of the Metropolitan Water District of Southern California.

Another threat to completion of the Aqueduct arose in February, 1947, when the Comptroller General of the United States questioned the legality of the project under the War Powers Act.

Again the City and the Navy quickly joined forces to avert an interruption in building the desperately needed facility. Mayor Knox, Sen. Sheridan Downey, Mr. Heilbron, Mr. Burkholder and Navy officials testified Feb. 26 before the Senate Committee on Expenditures in the Executive Departments.

As a result of this action, appropriate legislation was introduced into the House and Senate, specifically authorizing the Navy to continue construction under existing contracts.

Sen. Downey, who previously had actively supported San Diego's cause, was assisted this time by Sen. William F. Knowland in introducing and pushing the Senate Bill to a favorable vote. San Diego's Representative to Congress, Charles K. Fletcher, introduced the House Bill, which has not yet come to a vote.



1947



CITY COUNCIL (left to right) Vincent T. Godfrey, Chester L. Dorman, Charles C. Dail, Mayor Harley E. Knox, Gerald C. Crary, Elmer H. Blase, Charles B. Wincote.

Beginning with the first filings on Colorado River water which were made by San Diego April 15, 1926, the City has been the active agency in promoting the development of this source for the community's water needs. In this leadership, the City has had the able assistance of the Chamber of Commerce and other civic groups.

Facts About San Diego Aqueduct

The Aqueduct is a gravity flow conduit tapping the Metropolitan Aqueduct at the westerly portal of San Jacinto tunnel, and extending 71.1 miles southerly to San Vicente Reservoir. It reaches across some of the most rugged country ever traversed with a water line, and its construction in a 2½-year period during and immediately after the War was an outstanding achievement.

The line includes seven tunnels, all in San Diego County. These total 4.4 miles, ranging in length from 500 feet to 5,850 feet.

Except for 1.75 miles of steel 48-inch pipe, the remainder of the conduit is reinforced concrete pipe, ranging from 96 to 48 inches in diameter.

A regulating reservoir, with a capacity of 1800 acre-feet, is located about two miles from the take-off at San Jacinto tunnel.

The tunnels are concrete lined to a finished diameter of six feet. Approach structures permit transition from double pipe line to single tunnel line, with one opening blocked off until enlargement of the aqueduct requires installation of a second pipe.

All tunnels and some of the conduits in relatively inaccessible terrain have been built to the full ultimate capacity of 100 million gallons per day, while most of the line has a capacity of 50 million gallons per day.



Community Cooperation...

County Supports Expanded Water Program



Top — David W. Bird
Below — Dan Rossi



De Graff Austin,
Chairman



Top — Dean Howell
Below — James A. Robbins

The Board of Supervisors, representing the San Diego County Government, has been constantly alert to further a broad program of water development that would benefit the entire area. The bill creating the enabling act which laid the groundwork for establishing County Water Authorities was sponsored by the Board. This measure, passed by the State Legislature, was signed by Gov. Earl Warren May 17, 1943. Just a year later, May 16, 1944, an election called by the Board resulted in a decisive vote, 15 to 1, for organization of the San Diego County Water Authority, which was effected the following June 9.

While water development was primarily the problem of the communities concerned, the County Government as a political subdivision lent its assistance whenever required. Its representative, on Aug. 8, 1931, signed the Seven

Party Agreement of 1930, in which San Diego rights in the Colorado River were designated as those of "The City of San Diego and or the County of San Diego."

A recent instance of this inter-governmental teamwork was authorization of Frank T. Dunn, Assistant District Attorney, to represent the County at hearings held by the Reconstituted President's Committee on Methods of Financing the San Diego Aqueduct Project, held Oct. 21-22, 1946, in Washington, D. C. Mr. Dunn, on this occasion, ably supported the contentions of Mayor Harley E. Knox and G. E. Arnold, Assistant City Manager, and Fred A. Heilbron and J. L. Burkholder, representing the Water Authority.

The same cooperative spirit is being manifested in working out other phases of the overall City-County water problem.



1947

Chronology of Important Events

Success Crowns Long Drive for Colorado River Water

June 17, 1919

Bill introduced in Congress by Rep. William Kettner, of San Diego, for construction of an All-American Canal did not come to vote; nor did a second bill by the same author, offered Jan. 7, 1920, which proposed, in addition, construction of "such storage reservoirs and other works as might be found necessary to provide an adequate water supply."

July 25, 1921

City Council first discussed the Colorado River as a potential source of supply.

Dec. 12, 1921

Secretary of Interior held Southwest Conference at San Diego on problems of Colorado River and proposed report to Congress for River development.

Feb. 28, 1922

Fall-Davis report on Colorado River presented to Congress, recommending building of a dam "at or near Boulder Canyon" and the All-American Canal.

April 25, 1922

Rep. Phil D. Swing of San Diego, with Sen. Hiram Johnson as co-author, introduced first of four bills for construction of a dam at or near Boulder Canyon, and the All-American Canal.

Nov. 24, 1922

Colorado River Compact signed at Santa Fe, N. M., by representatives of California, Arizona, Nevada, Utah, Wyoming, New Mexico and Colorado. The compact required the approval of the State Legislatures and of Congress before it took effect.

May 10, 1923

Boulder Dam Association organized at Fullerton to conduct a nation-wide campaign for Boulder Dam. John L. Bacon, Mayor of San Diego, named President.

April 8, 1925

Colorado River Compact approved by California legislature, with reservation that it would not be effective until the United States authorized a dam at or near Boulder Canyon of a capacity of not less than 20,000,000 acre feet.

April 15, 1926

San Diego applied to Division of Water Resources, California, for right to 112,000 acre feet annually from Colorado River.

Dec. 21, 1928

Swing-Johnson bill signed by President Coolidge after approval by Senate Dec. 14, and by the House May 25, of the same year.

March 4, 1929

California Legislature accepted limitations imposed by Congress on its use of Colorado River water, of 4,400,000 acre feet of the waters apportioned by the Compact, plus not more than one-half of any excess or surplus waters, and ratified the Compact on a six-State basis. Arizona did not ratify until 1944.

Aug. 18, 1931

Seven Party Agreement apportioning California's share of Colorado River water among seven agencies, signed.

Feb. 15, 1933

Contract executed between Secretary of the Interior and The City of San Diego providing for 250,000 acre-feet of storage capacity in Boulder Reservoir, and for the delivery of 112,000 acre-feet of water to San Diego City and/or County each year at a point in the Colorado River immediately above Imperial Dam.

Oct. 2, 1934

Contract with Secretary of Interior executed by The City of San Diego, providing for construction of capacity in All-American Canal Project for the diversion and carriage of 155 c.f.s. allotment of Colorado River water to The City and/or County of San Diego. (This contract was signed by the Secretary of Interior after it had been authorized by the voters of San Diego April 25, 1939.)

Feb. 12, 1937

Hill-Ready-Buwalda report favoring further development of local resources, to be followed later by the construction of a transmountain connection to the Colorado River through the All-American Canal.

May 17, 1943

Gov. Earl Warren approved enabling act drafted by Phil D. Swing and introduced by Sen. Ed Fletcher, prescribing the procedure for



the organization of county water authorities, and fixing the powers of such authorities and the manner and scope of their operation.

May 28, 1943

Cooperative contracts executed between Federal Government and The City of San Diego and County of San Diego, providing for report on estimated cost of an aqueduct connection between the water systems serving San Diego and adjacent county areas, and the Metropolitan Water District on the one hand, and the All-American Canal on the other.

June 9, 1944

San Diego County Water Authority organized, consisting of nine public agencies.

Sept. 12, 1944

Senate hearing in San Diego on the community's water problem, presided over by Sen. Sheridan Downey.

Oct. 3, 1944

Appointment by President Roosevelt of a committee on San Diego water problems, which included Phil D. Swing, General Counsel for the Water Authority. The late Walter W. Cooper, City Manager, was invited to advise with the committee.

Nov. 29, 1944

President Roosevelt transmitted a communication to the Senate approving the Report of the Committee on San Diego Water Problems and advising that he had directed immediate construction by the Federal Government of an aqueduct connecting the Colorado River Aqueduct of The Metropolitan Water District with the water system of San Diego at its San Vicente reservoir, as a war-time emergency project. The President also wrote the City of San Diego and the Water Authority that he desired local interests to press negotiations with the Metropolitan District for arrangements to operate the Aqueduct after its completion.

March 2, 1945

War Production Board interposed objections to construction of the Aqueduct because of manpower and material shortages. Late that month, the Board recommended one year's delay in the work.

April 27, 1945

Following conferences with Washington officials, agreement was reached to start construction in 90 days, instead of one year.

May 18, 1945

First contract on San Diego Aqueduct awarded by U. S. Navy for construction of Poway, Fire Hill and San Vicente tunnels.

Sept. 12, 1945

Ground-breaking ceremony for construction of Aqueduct, at West portal of San Jacinto tunnel.

Oct. 17, 1945

Under threat of terminating work at the close of the War, a contract was executed between the U. S. Navy acting for the Government, and The City of San Diego providing for the continuation of construction of the San Diego Aqueduct and lease of the aqueduct to The City of San Diego.

Nov. 2, 1945

Authority Directors take first steps toward annexing to Metropolitan Water District.

March 26, 1946

Informal meeting of City, County and Authority officials held in Authority offices to consider District's terms for annexing Authority. Consensus was to accept terms.

March 29, 1946

The Board of Directors of the Authority formally applied to the Board of Directors of the District for consent to annex the corporate area of the Authority to the District.

April 5, 1946

Consent given by Metropolitan Water District Directors to proposed annexation of the Authority upon specified conditions.

June 10, 1946

Board of Directors of the Authority approved recommendation of General Manager and Chief Engineer to construct feeder lines from Aqueduct at estimated cost of \$2,000,000.

Nov. 5, 1946

San Diego voters approved, about 10 to 1, (1) Merger of City-County Colorado River water rights with those of the Metropolitan District; (2) transfer to the County Water Authority of the San Diego-Navy contract for construction of the Aqueduct.

Water Authority voters approved, about 16 to 1, (1) Annexation of the Authority to the Metropolitan District; (2) acceptance by the Authority of the transfer of the Navy contract from the City; (3) bond issue of \$2,000,000 for construction of Aqueduct extension and branch lines to serve Authority agencies.

Dec. 13, 1946

Board of Directors, Metropolitan District, adopted resolution that all terms and conditions for annexation had been met.

Dec. 17, 1946

Secretary of State certified that the Water Authority had been annexed to the District.

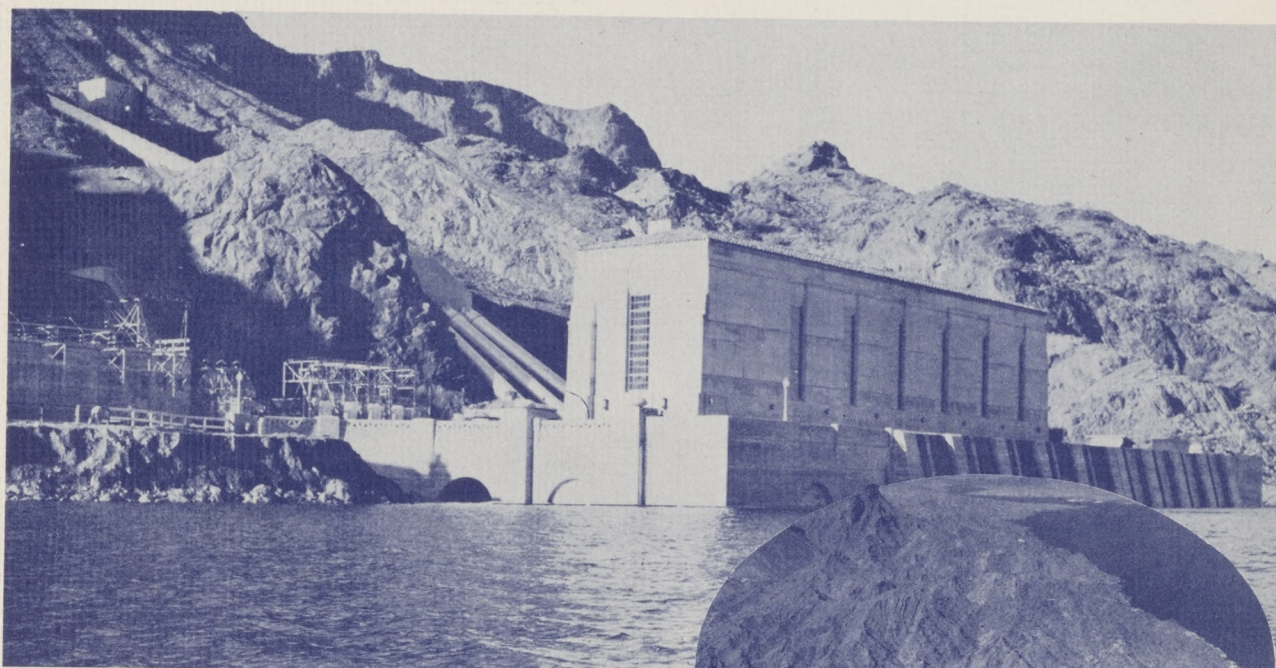
Dec. 11, 1947

Aqueduct dedicated and put into operation.



Metropolitan Aqueduct...

Meeting a Vast Empire's Most Vital Need



Metropolitan Aqueduct Intake Pumping Plant, two miles upstream from Parker Dam on the Colorado River.



Air View of Parker Dam

Those familiar with the limited local water resources of the coastal area of Southern California long ago recognized the need of providing a supplemental supply from the Colorado River—the "last water hole of the Southwest." It has been almost a quarter of a century since the first engineering studies were set underway to plan the building of a giant aqueduct that would deliver Colorado River water across deserts and mountains to the rapidly growing communities in this coastal territory.

In October, 1923, the first field surveys to determine the best route for an aqueduct from the Colorado River were launched under the direction of William Mulholland, then Chief Engineer of the Los Angeles municipal water system. For five years, prior to the organization of the Metropolitan Water District, this work was carried forward by Los Angeles. At the time this engineering work was started, the

City of Los Angeles made a filing on the Colorado River for the right to divert 1500 cubic feet per second. A few years later the City and County of San Diego made a filing on the river for the right to divert 155 cubic feet per second.

As preliminary engineering studies were going forward on the aqueduct project a number of other growing communities in Southern California came to realize that they too stood in urgent need of a supplemental water supply from the Colorado. Individually these cities were unable to assume the great cost of building their own aqueducts from the river.





John H. Ramboz
Board Vice Chairman
and Acting Chairman

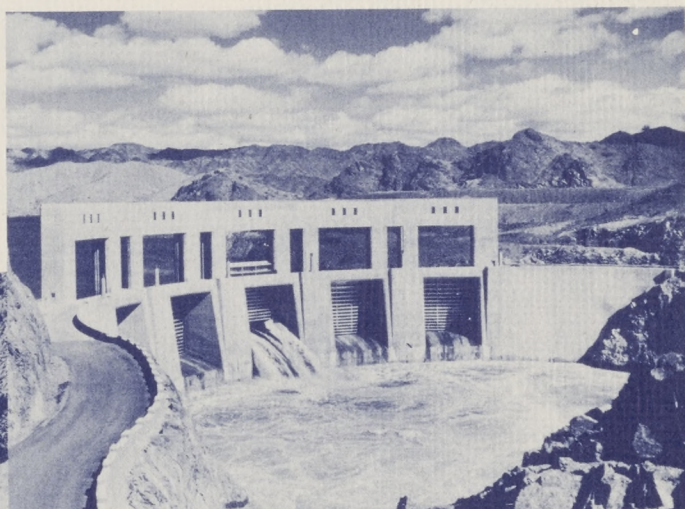


Victor H. Rossetti
Chairman, Metropolitan Water District Board,
January to November, 1947



A. H. Allen
Board Secretary

Parker Dam on the Colorado River was built with funds supplied by the Metropolitan Water District. It has formed Lake Havasu, a reservoir extending 50 miles upstream. On the California shoreline of this reservoir is the Metropolitan Aqueduct Intake.



A concrete lined canal section of the Metropolitan Aqueduct where it makes a connection with the portal of a tunnel section. Other Aqueduct sections take the form of covered concrete conduits and inverted siphons.



1947

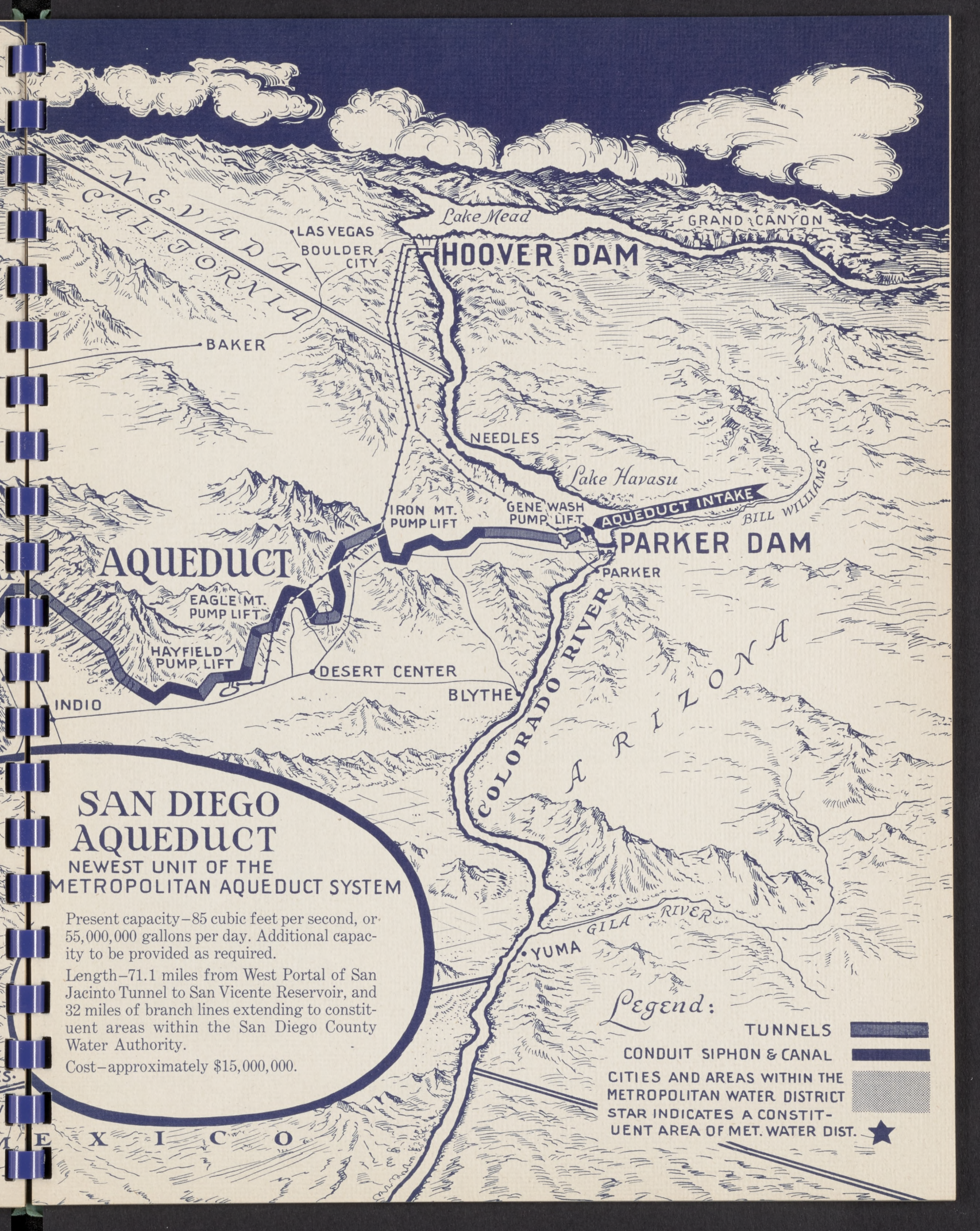
AQUEDUCT SYSTEM OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Ultimate capacity—1655 cubic feet per second, or
1,100,000,000 gallons per day.

Length—including new San Diego unit—481 miles.
Cost—approximately \$200,000,000.

Shaded areas on map indicate District territory,
with population of 3,100,000.





SAN DIEGO AQUEDUCT

NEWEST UNIT OF THE
METROPOLITAN AQUEDUCT SYSTEM

Present capacity—85 cubic feet per second, or 55,000,000 gallons per day. Additional capacity to be provided as required.

Length—71.1 miles from West Portal of San Jacinto Tunnel to San Vicente Reservoir, and 32 miles of branch lines extending to constituent areas within the San Diego County Water Authority.

Cost—approximately \$15,000,000.

Legend:

TUNNELS

CONDUIT SIPHON & CANAL

CITIES AND AREAS WITHIN THE
METROPOLITAN WATER DISTRICT
STAR INDICATES A CONSTIT-
UENT AREA OF MET. WATER DIST.



This common need for Colorado River water on the part of a number of Communities led to the adoption by the California State Legislature in 1927 of the Metropolitan Water District Act. Under the terms of this Act the people of eleven Southern California cities in Los Angeles and Orange counties in November, 1928, voted to become parts of The Metropolitan Water District of Southern California.

On December 29 of the same year newly appointed directors from these original member cities met in Pasadena and organized the Metropolitan Water District. Today there are fifteen cities and areas within the boundaries of the District. They have a population of 3,100,000 and a total assessed valuation of approximately \$3,500,000,000.

When the District was permanently organized in February, 1929, three Board officers were elected. They were Chairman W. P. Whitsett, Vice Chairman Franklin Thomas, and Secretary S. H. Finley. Mr. Whitsett and Mr. Thomas were reelected to their respective offices for a total of nine two-year terms. Col. Finley also continued to serve as Board Secretary until a short time prior to his death in 1942.

When the Metropolitan Water District was organized it took over from the City of Los Angeles the task of carrying forward the engineering studies in connection with the planning of the aqueduct project, and a settlement was effected by which Los Angeles was equitably compensated for necessary costs previously incurred.

Frank E. Weymouth was made the Chief Engineer of the Metropolitan Water District, and under his direction the huge task of planning the aqueduct project was pushed forward. Early in 1931 Chief Engineer Weymouth and a Board of Consulting Engineers made their recommendations as to the route that should be followed by the aqueduct. These recommendations were based upon eight years of intensive study in which detailed field surveys had been made over an area of more than 20,000 square miles of desolate desert and mountain country. The route selected as the most feasible and practicable was called the Parker route, and is the one now traversed by the aqueduct.

On September 29, 1931, the citizens of the District authorized by a ratio of four to one a bond issue of \$220,000,000 to finance the building of the world's largest and longest domestic water supply line. Following a little more than a year of legal and engineering preparation, first construction work on the aqueduct was started in December, 1932.

With 38 construction camps operating along a 300 mile front, the building of the Metropolitan Aqueduct went forward without interruption night and day for a period of almost nine years, and the work was completed in June, 1941.

Construction of the aqueduct was carried forward to successful completion during the period of a depression which gripped the entire country. It provided constructive employment for more than 38,000 men during the course of the building period. It provided business for scores of manufacturing and fabricating mills and shops in almost every section of the United States. Its cost, when it was ready for operation, was \$22,000,000 less than originally was estimated.

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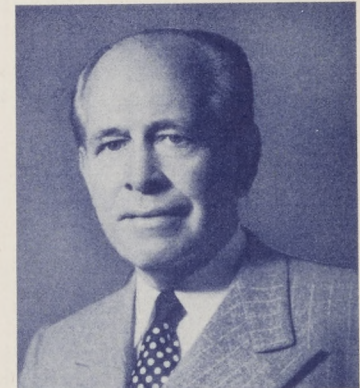
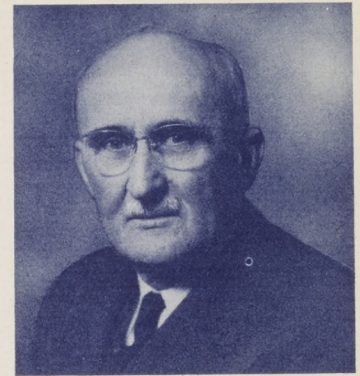
Metropolitan Water District Officers, top to bottom

Julian Hinds
General Manager and Chief Engineer

James H. Howard
General Counsel

James M. Luney
Controller

Ira R. Pontius
Treasurer



Colorado River Association

Spearheads California's Fight for Water

Acting in good faith on the basis of firm contracts with the Federal Government, Southern California communities have assumed an obligation of more than \$500,000,000 invested in water and power development works on the lower Colorado River. The people of the San Diego County Water Authority share in this obligation, which was assumed, primarily, to obtain a permanent right to Colorado River water required to sustain present development and meet future needs.

California communities seek only to safeguard and retain established, long standing water rights on the River. They are not asking that Congress authorize new water diversion projects for the benefit of California. However, a large number of such projects are being proposed for other portions of the River basin.



Preston Hotchkis
President, Colorado
River Association

A view of the Colorado
River a short distance
below Parker Dam.



Ben P. Griffith
Secretary, Colorado
River Association

A comprehensive report on the Colorado River issued by the Bureau of Reclamation lists 134 proposed new projects. The Bureau states that if all of them are built they, together with projects now operating or authorized will call for 25 per cent more water than is available in the River. Bills providing for the construction of a number of these proposed new projects have been introduced in Congress. This situation confronts California with the necessity of protecting its rights to the Colorado River water for which it has contracted and for which it has invested hundreds of millions of dollars.

Public spirited men and women in all parts of California have recognized the pressing necessity for action. They have formed the Colorado River Association, an organization of private citizens pledged to the protection of established water rights on the river and the support of feasible new projects which would not impair the present or future uses of water by operating projects.



1947

Chula Vista...



CHULA VISTA CITY COUNCIL:

(left to right) Z. Dwight Kidder, Aaron Riesland, Councilmen; L. C. Koes-ter, Mayor; Dudley Nashold, Ralph Dyson, Councilmen; Herbert V. Bryant, Administrative Officer.

Although essentially a home community, Chula Vista has developed remarkably along agricultural, horticultural and manufacturing lines in recent years. The 1920 population of 1700 was more than doubled by 1930, and 10 years later had passed 5000. The 1947 estimate, 14,500, represents a seven-year gain of 179 percent.

The population increase reflects the expansion that has taken place in the area's agricultural pursuits and in the addition of industrial activities. These have accentuated the problem of water, the supply of which comes from the Sweetwater System operated by the California Water & Telephone Co. Threatened curtailment of this supply, due to the near drought conditions of recent years, prompted the community to join the movement that resulted in setting up the San Diego County Water Authority.

About 2000 acres adjoining Chula Vista are planted to citrus, principally lemons, and 1100 acres to celery, for which the area is famed. Other crops include cucumbers, beans and peppers. With dairy products, poultry, eggs and rabbits, agriculture annually exceeds \$6,000,000 in value.

Completion of the La Mesa-Sweetwater extension of the San Diego Aqueduct, about April 1, will provide Chula Vista with 1.6 million gallons of Colorado River water daily to supplement the supply derived from Sweetwater Reservoir. This will give the city a safety margin to assure its continued growth.

Under consideration, in conjunction with National City, is the formation of an irrigation district to serve the two communities.

Chula Vista's representative on the directorate of the County Water Authority is Arthur L. Lynds, long a leader in the movement to assure an adequate water supply.

1769



Fallbrook Public Utility District

DIRECTORS, FALLBROOK

PUBLIC UTILITY

DISTRICT:

(left to right) Robert Gray, Harry Sachse, Vice President; E. J. Schmitz, President; Victor Westfall, Otis Heald.



The community of Fallbrook is the center of a highly productive area in which avocados, lemons and olives thrive. Prospects for further substantial development have been enhanced by the assurance of delivery of more than 300,000 gallons of Colorado River water daily that will come with the completion of the Fallbrook - Oceanside extension of the San Diego Aqueduct, about August 1, 1948.

This supply will augment the water which is being pumped from wells in the bed of the nearby Santa Margarita River by the Fallbrook Public Utility District. The utility, organized in 1922, became a member of the San Diego County Water Authority when the people of its area voted, May 16, 1944, with other communities to establish the parent agency for the

distribution of water when received from the distant Colorado.

Although an additional supply is now assured, Fallbrook is proceeding with plans for development of the Santa Margarita River as a source that will provide for future needs of the fast growing area. The District now includes 5000 acres, but its potential is estimated at upward of 40,000 acres.

Fallbrook leaders foresee the time when a dam will be built on the River to store more than 200,000 acre feet of water. Directors of the District, and George Yackey, their engineer and general manager, are strongly supporting the project.

E. J. Schmitz, President of the District's Board of Directors, represents the utility and the community on the Board of the Water Authority.



1947

Lakeside Irrigation District...



BOARD OF DIRECTORS, LAKESIDE IRRIGATION DISTRICT: (left to right) Tom LaMadrid, Allen G. Mitchell, Chairman; Ernest E. Nelson.

Lakeside, a thriving community of 5,000 in the foothills 21 miles northeast of San Diego, is the hub of a potentially highly productive center whose future development is keyed primarily to water.

It is adjacent to the San Diego River, from the sands of which come the water used by agricultural, horticultural and domestic consumers. This has been a temporarily dependable source, meeting the present requirements, but with limitations as to the area's further expansion. Having this in mind, the citizens approved membership in the San Diego County Water Authority, thereby assuring an additional water supply upon completion of the San Diego Aqueduct.

The Lakeside area is served by three water organizations. These are the Lakeside Irrigation District, which is represented in the Water Authority; Lakeside Farms Mutual Water

Company, and Riverview Farms Mutual Water Company. Each receives its supply from wells in the stream bed. Of the three, the Lakeside Irrigation District serves, primarily, domestic users. The District was organized August 11, 1924.

Dairying, stock raising, farming, ranching and poultry are the principal activities in the zone surrounding Lakeside. Close by are tracts which await only the touch of water to transform them into homesites and productive acres.

The Lakeside district will receive this additional supply of water from the distant Colorado when the La Mesa-Sweetwater extension of the San Diego Aqueduct is completed, about April 1. The allocation will be 50,000 gallons daily.

The District's representative on the Water Authority's Board of Directors is Allen G. Mitchell.



La Mesa, Lemon Grove and Spring Valley

Irrigation District

IRRIGATION DISTRICT BOARD OF DIRECTORS:

(left to right)

R. M. Levy, Chairman; William West, William Sperry, Joseph Levikow, Jack Schrader.

INSET: M. J. Shelton, Assistant Manager and Engineer; C. Harritt, Manager and Secretary; W. H. Jennings, Attorney.



The La Mesa, Lemon Grove & Spring Valley Irrigation District, organized in 1911, includes the City of El Cajon and additional unincorporated areas. Originally a municipal water district, it was changed to an irrigation district in 1913.

The area includes 18,275 acres with more than 11,000 consumers, a population of 40,000, and an assessed valuation of \$20,664,540. Average water consumption exceeds 8 million gallons daily. The District's source of supply is the San Diego River watershed. To this will be added 3.14 million gallons daily from the Colorado River upon completion of the La Mesa-Sweetwater extension of the San Diego Aqueduct, about April 1.

The District obtained the Cuyamaca properties in 1925. Until then, water had been pur-

chased from the Cuyamaca Water Company, which operated the flume system, Cuyamaca Dam, Murray Dam, Monte pumping plant, and other properties of the old Flume Company.

Subsequent to purchasing the Cuyamaca Water System, the Irrigation District took over distribution systems owned by groups, associations, and mutual water companies.

In 1932, an agreement was entered into with San Diego for joint use of the water of the San Diego River and El Capitan Reservoir. The District obtained 10,000 acre feet of storage in El Capitan, and gave the City 5,000 acre feet storage in Murray Dam.

W. H. Jennings, the District's counsel, is its representative on the Board of Directors of the San Diego County Water Authority.



1947

National City...



CITY COUNCIL

Left to right — Frederick J. Thatcher, Ray Newberry, Gilbert E. Fritz, Mayor; Frank Cordingly, Richard E. Adams.

Need for a sufficiency of water—a common concern of the entire area—prompted National City to vote overwhelmingly for creation of the San Diego County Water Authority.

A population approaching 18,000 ranks National City as the second largest community in the County, and as an important segment of the San Diego metropolitan district.

Citrus and truck farming, a number of small manufactories, and domestic consumers imposed demands which severely taxed the existing water supply, depleted after several years of subnormal rainfall. The City, since 1888, has been served by the California Water & Telephone Co. from its primary source, Sweetwater Reservoir. Into this basin, along about April 1, 1948, will pour a supplemental supply of 1.53 million gallons of Colorado River water daily, conveyed from the San Diego Aqueduct by the La Mesa-Sweetwater extension. Con-

struction of the branch line was begun late in 1947.

National City, separated from San Diego only by a boundary line, has within its limits a portion of the great Naval Station which covers hundreds of acres of the harbor front, and an important submarine repair facility. The substantial growth recorded during World War II, and retained, was the principal factor in emphasizing the community's problem of developing an increased water supply for present and immediate future needs.

Formation of an irrigation district, to include neighboring Chula Vista, is one of the foremost projects under consideration by the leaders of both cities.

Del Dickson, Chief Administrative Officer, is National City's representative on the Water Authority's Board of Directors.

1769





OCEANSIDE'S CIVIC LEADERSHIP: (left to right) John H. Landes, City Clerk; Leonard Snyder, F. Clay Horn, Councilmen; Arthur L. Britch, Mayor; Harry Witman, E. C. Wickerd, Councilmen; James E. Neal, Administrative Officer; J. Moore, City Attorney.



ROBERT A. WEESE
Water Superintendent

Oceanside

Water has been Oceanside's foremost problem since the City was incorporated in 1888. The civic leaders of that day demonstrated the same foresight that their successors have evinced as the community grew and prospered.

The first step in Oceanside's water development program was the City's purchase of a privately operated company in 1890 for \$4,500. The "system" consisted of a reservoir with a capacity of 50,000 gallons, and a 2-inch single-action steam pump.

Since then, Oceanside has invested approximately \$750,000 in additions and extensions to its water system, and in 1947 was serving 2400 consumers through 55 miles of mains ranging in diameter up to 18 inches.

Oceanside's growth has been typical of the Southern California trend. The 1900 population was about 300. The census of 1940 showed 4,650, a figure that was more than doubled, to 10,700, in 1945. The population today is estimated at 12,000.

This population growth accentuated the City's water problem, and resulted in the development of a sub-surface supply from wells in the bed of nearby San Luis Rey River, a stream which like so many in Southern California is dry except during the rainy season. Water consumption increased in the period 1925-1947 from 301 million gallons to 814 million gallons annually—270 percent.

Oceanside's share of Colorado River water will be 1,210,000 gallons daily upon completion of the Oceanside-Fallbrook extension of the San Diego Aqueduct. This additional supply is expected to be available August 1, 1948.

After joining other communities to form the San Diego County Water Authority in 1944, the City voted September 30, 1946, to retain its membership in the Authority, and November 5, 1946, joined in the popular vote for affiliation of the Authority with The Metropolitan Water District of Southern California.

Harold N. Beck, co-publisher of The Blade-Tribune, is Oceanside's representative on the Board of Directors of the Water Authority.



1947

15 Dams Store Water in San Diego County



Morena Dam

Morena Reservoir, one of the three principal units comprising the Cottonwood-Otay storage system, is located 62 miles east of San Diego. It has a capacity of 18.53 billion gallons, with a daily potential supply of 5 million gallons.

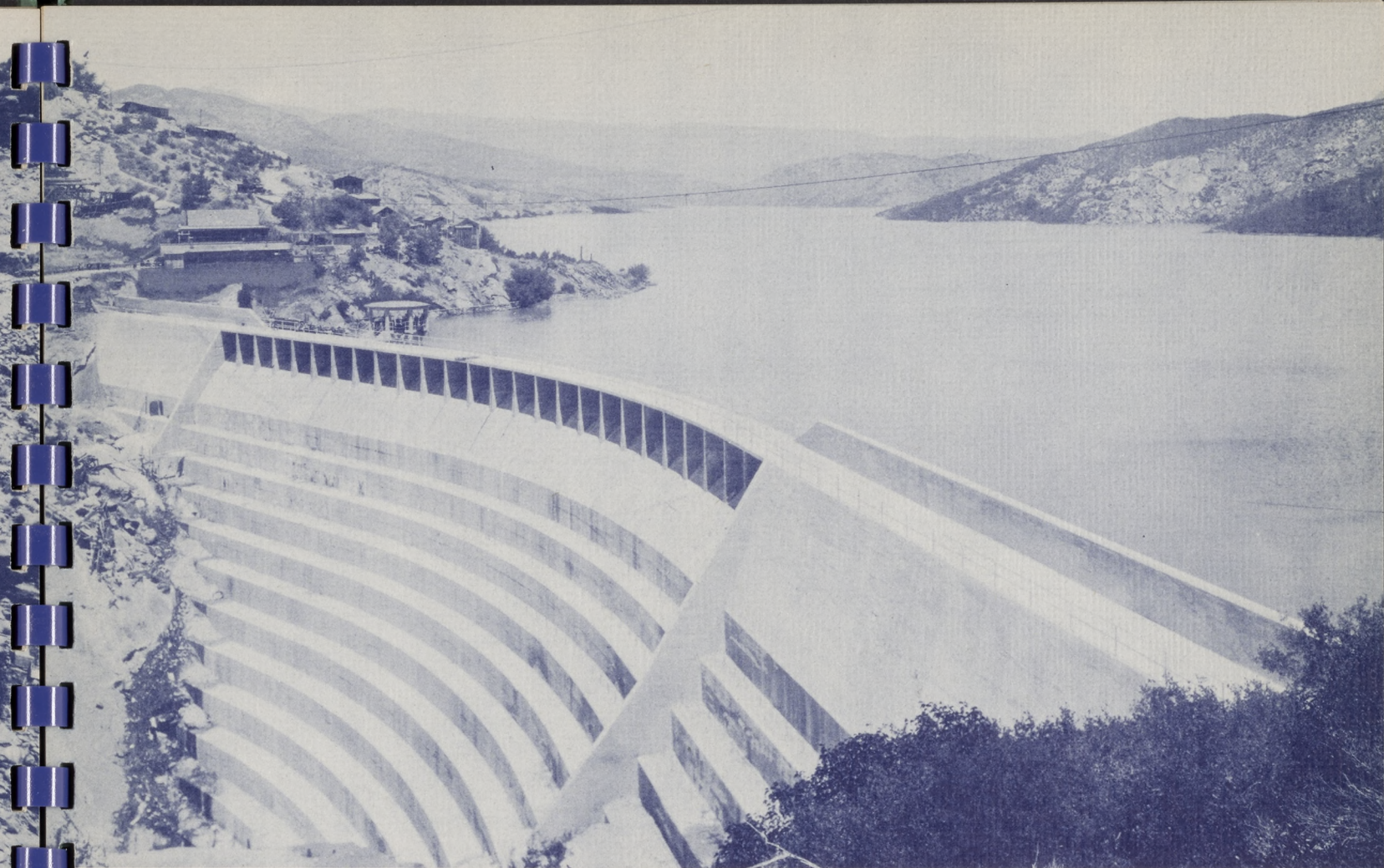
The dam, one of the earliest water development projects in San Diego County, is of the rock-fill type. Construction was started by the Southern California Mountain Water Company in 1895 and halted in 1898. Operations were resumed in 1909, and the first stage completed in 1912.

The City of San Diego acquired the dam, land, rights of way and pipe lines in 1914 for \$1,500,000, financing the purchase through sale of bonds. The original 152-foot structure was raised five feet in 1916-17; another 10 feet were added in 1922-23, and four feet in 1930. The dam now is 550 feet long and 171 feet high. A 312-foot spillway at elevation 3039.4 can control a maximum flood of 50,000 cubic feet per second.

Morena Reservoir receives runoff from 120 square miles of the upper Cottonwood River watershed. It is located where rainfall is usually heavy, and its storage provides a reserve supply for dry years. Water released from Morena Reservoir flows by gravity about 12 miles down via Cottonwood Creek to Barrett Reservoir.

1769





Barrett Dam

Barrett Dam, providing a deep reservoir for water released from Morena as well as for catchment in the Cottonwood and Pine Valley Creek watersheds, was started in 1921 and completed in 1923 by The City of San Diego with a \$1,500,000 bond issue and funds transferred from the Otay project after completion of Savage Dam.

This gravity concrete dam was built to a height of 171 feet, with provision for an additional 71 feet. It is 700 feet long, has a storage capacity of 13.95 billion gallons, and has a safe yield of 4.8 million gallons daily.

A 26-gate spillway, on the central portion

of the dam, functions automatically when water reaches within two feet of the top, and can discharge 60,000 cubic feet per second. The top of the spillway gates is at elevation 1615.0.

When fully developed, at a height of 242 feet, capacity will be increased to 43 billion gallons and the safe yield to 9.3 million gallons daily.

The reservoir receives runoff from 130 square miles of watershed below Morena Dam. At present the surface area of the reservoir when full is 861 acres.

Dulzura conduit conveys water from Barrett Reservoir 12 miles to Dulzura Creek, down which it flows a similar distance into Lower Otay Reservoir.



1947



Lower Otoy

Lower Otoy Reservoir, third of the major units of the Cottonwood-Otoy System, is located on the Otoy River about 20 miles southeast of San Diego. The original rock-fill dam of the same name was built in 1895-1900 by the Southern California Mountain Water Co., and with other holdings was acquired by the City in 1913 for \$2,500,000. Just three years later it was destroyed in a record-breaking flood.

The dam was replaced in 1917-18 by a gravity concrete masonry structure 700 feet long and 145 feet high, which in 1934 was named in honor of the late H. N. Savage, City Hydraulic Engineer, who supervised the work.

Seasonal runoff from a watershed of 98 square miles and the regulated flow from Barrett are impounded behind Lower Otoy. The reservoir's capacity is 18.35 billion gallons. Although seldom full, Lower Otoy Reservoir is kept at a fairly high level to create sufficient pressure to force water through the pipe line to San Diego. The daily safe yield is 3.8 million gallons. An 18-gate spillway built into the dam, and an independent 16-gate spillway can control 60,000 cubic feet per second in flood. The top of the spillway gates is at elevation 490.7 and at this level the water surface area is 1266 acres.

The Otoy pipe line delivers water from the reservoir to the City and also connects with the small Chollas Regulating Reservoir for emergency use.

1769





El Capitan

El Capitan Reservoir is formed by a hydraulic fill rock embankment structure 1170 feet long, with top 217 feet above streambed. The drainage area, including that of Cuyamaca Reservoir owned by the La Mesa, Lemon Grove & Spring Valley Irrigation District, is 190 square miles.

El Capitan Reservoir, largest in the San Diego City system, has a storage capacity of 37.95 billion gallons, with a water surface of 1574 acres. The 510 foot spillway is designed to control floods of 102,000 cubic feet per second. Spillway crest is at elevation 750.

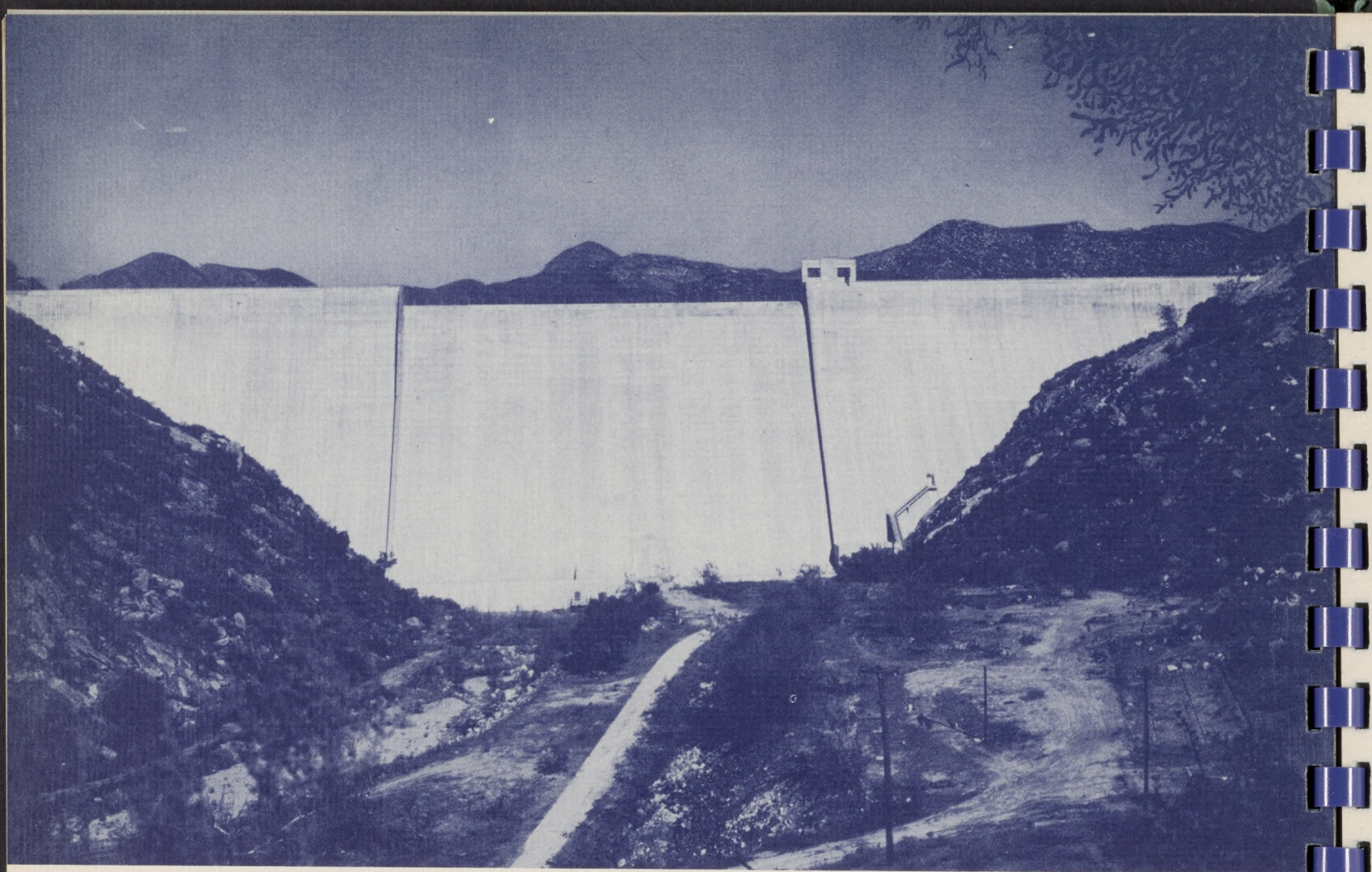
Storage rights in El Capitan, to the extent of 3.26 billion gallons, have been allocated to the La Mesa, Lemon Grove & Spring Valley Irrigation District.

Available to the City of San Diego is a safe yield of 10 million gallons daily.

Bonds were voted for the dam in 1924, but construction was not undertaken until 1932. The structure was completed in 1935, and within three years the reservoir was filled. Lack of rainfall in the interim, and heavy demands for military, industrial and domestic use, have reduced the storage to less than 11.0 per cent of capacity.



1947



San Vicente Dam

Construction of this newest unit of San Diego's impounding system was commenced in 1941 and completed in 1943. The reservoir, located on San Vicente Creek, approximately 28 miles northeast of the City, is formed by a gravity concrete masonry dam, straight in plan, and 199 feet above streambed. The structure is so designed that it may eventually be heightened to 310 feet. The drainage area is 75 square miles.

The dam is 980 feet long, with a 275-foot spillway having a capacity of 31,000 cubic feet per second. The spillway crest is at elevation 650.

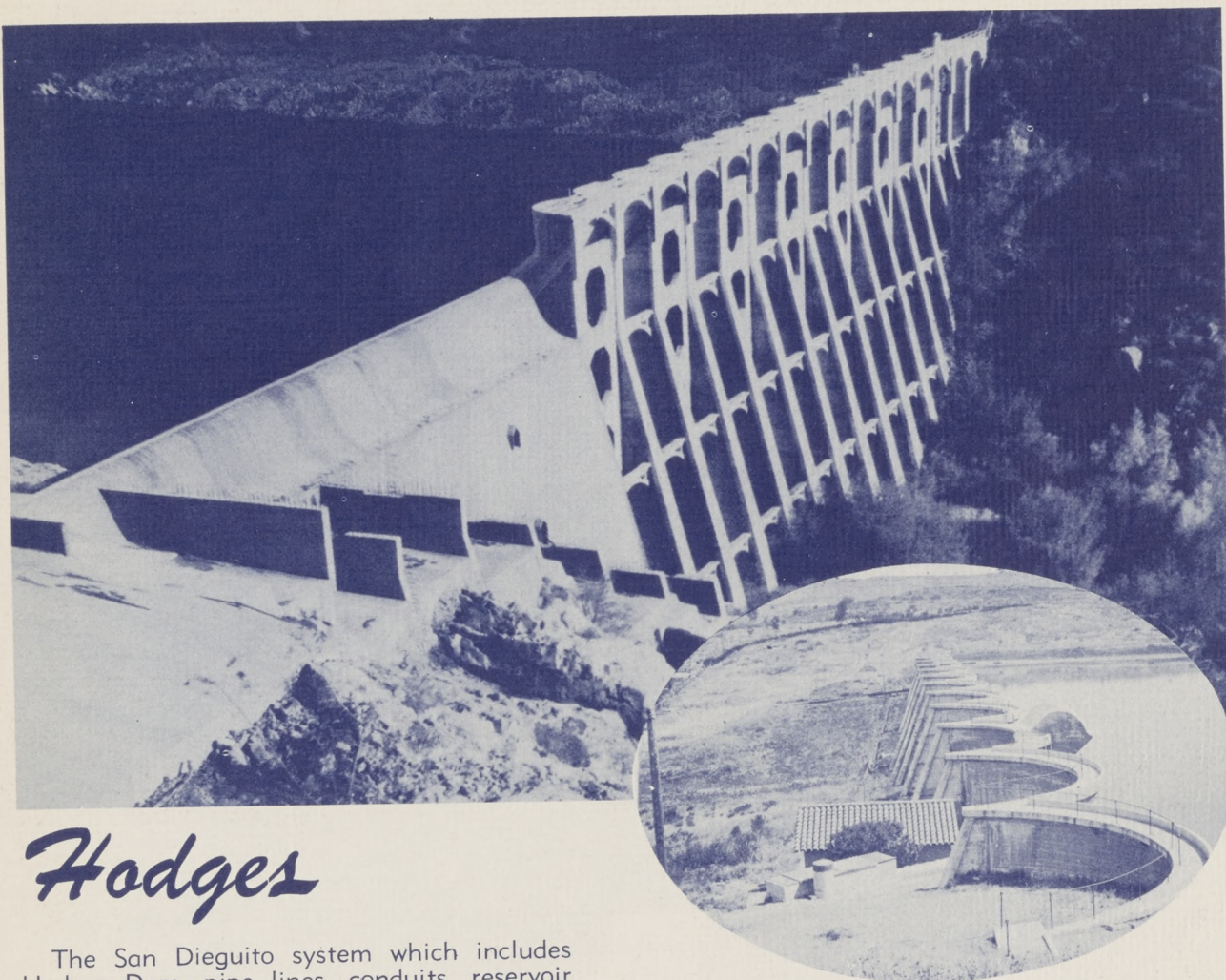
Storage capacity is 29.4 billion gallons, and the water surface, 1069 acres.

San Vicente Reservoir has a safe yield when local runoff is combined with excess water transferred from El Capitan Reservoir, of 5.3 million gallons daily. It will also be used for storage of Colorado River water, and for water from the San Dieguito watershed after completion of Sutherland dam and conduit.

Because of deficient rainfall since storage was commenced in December, 1942, the reservoir is less than 14.0 per cent full. No water has been withdrawn and none has been transferred from El Capitan Reservoir.

1769





Hodges

The San Dieguito system which includes Hodges Dam, pipe lines, conduits, reservoir sites, water rights and lands was acquired by the City under a purchase contract in 1925 for \$3,750,000.

Hodges Reservoir, located 25 miles north of San Diego on San Dieguito River, has a capacity of 12.23 billion gallons, and a daily safe yield of 5.6 million gallons of which 3 million gallons belongs to the City of San Diego. The dam, a multiple arch concrete structure, is 750 feet long and 130 feet high above streambed. Spillway elevation 315. Area flooded to spillway level, 1317 acres.

Water from Hodges is carried by conduit to the nearby San Dieguito regulating reservoir, whence it is piped to Torrey Pines filter plant, then pumped to a regulating reservoir for delivery to the city's distribution system.

Hodges Reservoir impounds the runoff from the 304 square mile watershed. Occasionally, this runoff attains flood proportions. A higher

dam is contemplated in order to conserve more water, also a dam at the Sutherland Damsite.

San Dieguito Dam, also a multiple arched, is 650 feet long and 51 feet high, located on a tributary of San Elijo Creek, forms the San Dieguito Regulating Reservoir. Spillway is at elevation 250.

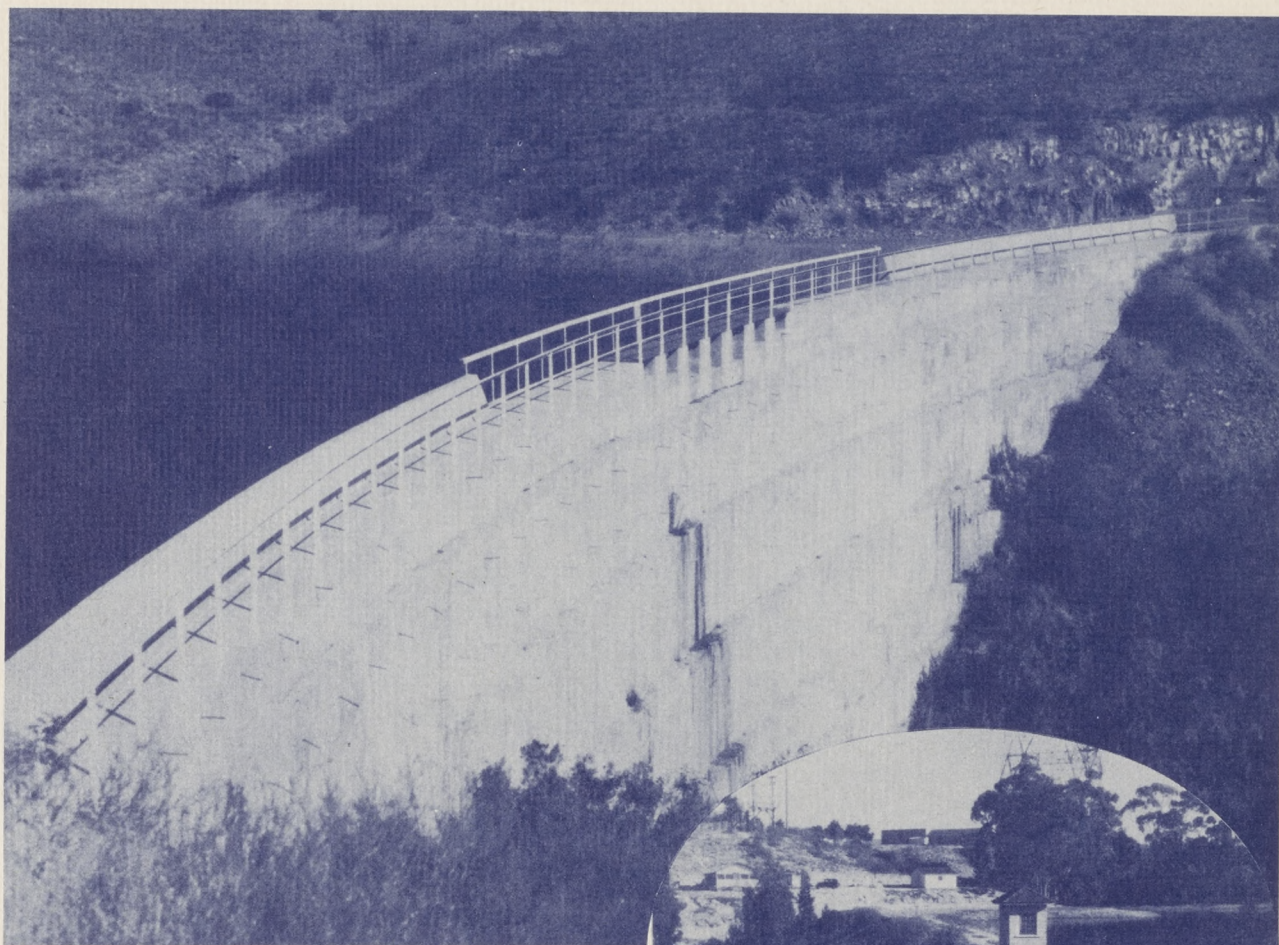
Both dams were constructed in 1917-18 by the San Dieguito Mutual Water Company.

Water from the San Dieguito system is also delivered to the Santa Fe and San Dieguito Irrigation Districts and the Del Mar Water, Light and Power Company.

When fully developed the safe yield of the San Dieguito system will be about 23.1 million gallons of which 14.6 million gallons will belong to the City of San Diego.



1947



Upper Otay

Upper Otay is one of the slenderest dams in the world for its height and length. Rising 80 feet above stream bed and 350 feet long, it is only 14 feet thick at the base, and four feet at the top.

This thin, highly stressed arch type concrete masonry structure is about 15 miles southeast of San Diego. Built in 1898-1901 by the Southern California Mountain Water Co., it was purchased by the City in 1913 along with other of the company's holdings. The reservoir has a storage capacity of 836 million gallons. Its water is released into the adjacent Lower Otay Reservoir. The drainage area is only 12 square miles.

Chollas Dam

The reservoir formed by Chollas Dam, near the eastern City limits, is a stand-by facility, holding a reserve supply for emergencies. Its capacity is only 107 million gallons, but it is always kept full. Water is received from Lower Otay Reservoir through the Otay Pipe Line.

The earthfill dam, 526 feet long and 41 feet high, was built by the Southern California Mountain Water Co. in 1901. It was included in the City's purchase of the Barrett-Otay part of the company in 1913.

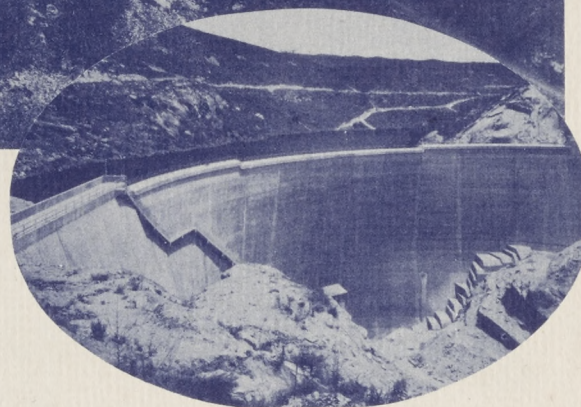
The high water level is at elevation 423.





Sweetwater Dam

Eight miles east of National City, was built in 1886-1888. It is of granite and cement construction, 396 feet long and 110 feet high. Storage capacity is 9.45 billion gallons. With Loveland Reservoir, it is part of the system operated by the California Water & Telephone Co., which supplies the National City-Chula Vista area.

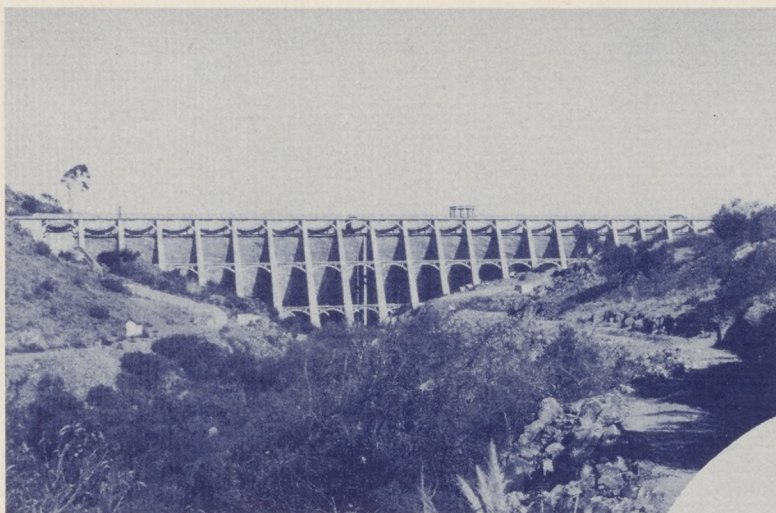


Loveland Dam

18 miles above Sweetwater Reservoir, was completed in 1945. It is a combination of gravity structure and constant angle arch dam, to conform with the topography, and is 563 feet long and 213 feet high. Capacity is 8.27 billion gallons.



1947

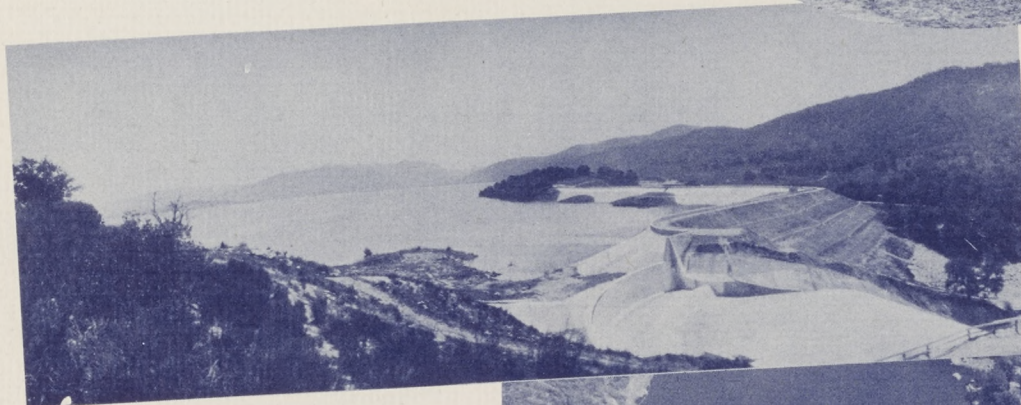


MURRAY DAM . . .

Near San Diego's east boundary, is multiple arch type, constructed in 1917, and owned by La Mesa, Lemon Grove & Spring Valley Irrigation District. Capacity, 1.98 billion gallons. City has substantial storage rights in the reservoir.

CUYAMACA DAM . . .

Earth-fill type, built in 1886 by the San Diego Flume Co., now owned by La Mesa, Lemon Grove & Spring Valley Irrigation District. Length, 665 feet; height, 35 feet, width at base, 145 feet. Capacity, 3.75 billion gallons.



HENSHAW DAM . . .

Hydraulic-fill type, constructed 1922-23, serves the Vista Irrigation District and Escondido Mutual Water Co. Capacity, 66.35 billion gallons.

WOHLFORD DAM . . .

Formerly Escondido Dam, built in 1894-95; rebuilt as earth and rock-fill structure in 1924, with capacity more than doubled, to 2.35 billion gallons. Receives most of water by conduit from Henshaw Reservoir. Owned by Escondido Mutual Water Co., which serves City of Escondido with water and power.





1947



Mount San Jacinto from the desert side. This towering mountain barrier is pierced by a 13-mile tunnel section of the Metropolitan Aqueduct. Beyond the tall peaks, as shown here, is the West portal of the tunnel where the San Diego Aqueduct makes its connection with the main line.



View of the Colorado River desert country traversed by the Metropolitan Aqueduct.

Continued from Page 26

The Metropolitan Aqueduct system may be said to consist of three principal divisions: (1) The main line of the Aqueduct, extending 242 miles from its intake on the Colorado River to Lake Mathews, a terminal storage reservoir; (2) Distribution lines extending 168 miles from Lake Mathews to cities and areas in Los Angeles and Orange Counties; (3) The San Diego Aqueduct, extending 71 miles from the West Portal of the San Jacinto tunnel to San Vicente Reservoir and serving communities and areas in the San Diego County Water Authority.

A few months after the Metropolitan Aqueduct was placed in service, in June, 1941, the United States was plunged into World War II. Suddenly, Southern California became the center of tremendous and vital military and naval operations, and a strategic area for war production. The assurance of a dependable and adequate water supply from the Colorado River made it possible safely to concentrate these vast wartime establishments in the coastal area.

The aqueduct provides a supplemental water supply for the cities and areas within the Metropolitan District. Increasing population and rapidly expanding industrial development have created serious overdrafts on local water sources. Water from the Colorado urgently is needed to supplement other sources of supply, and future growth and development are almost entirely dependent upon Metropolitan Aqueduct water.

Continued from Page 27

Pending in Congress is a joint resolution, which, if adopted, would authorize a suit in the U. S. Supreme Court to adjudicate the respective water rights on the Colorado River of the three lower basin states, Arizona, California and Nevada. California users of Colorado River water stand ready to have their rights on the river reviewed and permanently determined by the Supreme Court. Legislation to authorize such an adjudication is supported by the Colorado River Association, and by the public water and power agencies in California which have Colorado River water and power contracts with the Government.

Preston Hotchkis is President of the Association, and Ben P. Griffith, Secretary. The Executive Committee is composed of 42 representative men and women from communities throughout Southern California. Representing the San Diego area on the Executive Committee is Ewart Goodwin. Headquarters of the Association is at 306 West Third Street, Los Angeles 13.



The Mighty Colorado

Historic Stream Is "Last Water Hole of Southwest"

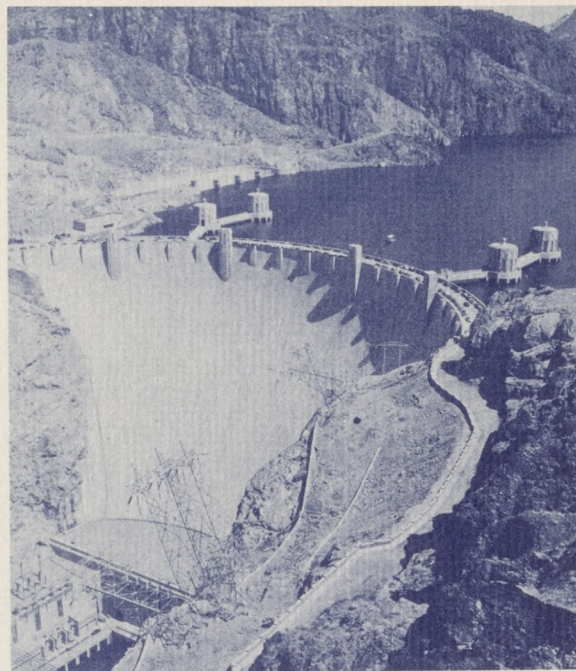
Rising on the snowcapped western slopes of the Rocky Mountains, the Colorado River is one of the major rivers of the United States and the largest river in the Southwest. Including its principal tributary, it flows for a distance of 1700 miles within the United States and 60 miles in Mexico where it empties into the Gulf of California.

The main stream of the Colorado and its tributaries flow through or form the boundary lines of seven states of the Union, namely Colorado, Utah, Wyoming and New Mexico, Nevada, Arizona and California. Its drainage basin covers an area of 242,000 square miles in this country—one-twelfth of the total area of Continental United States—and 2000 square miles in northern Mexico.

In 1540 Captain Hernando Alarcon, a Spanish navigator, set forth in search of the fabled Seven Cities of Cibola, believed to be "somewhere north of Mexico." He reached the northern shoreline of the body of water now called the Gulf of California, and there he discovered the Colorado River flowing into the sea.

For almost three centuries following its discovery, the Colorado River remained a river of mystery. In the latter part of the 18th century it was named El Rio Colorado (the red river) by Father Garces, one of a dauntless band of missionaries who braved the Colorado River desert country to carry the Cross to the native Indians.

There is a great deal of evidence to indicate that the Colorado River basin was widely populated thousands of years before the coming of the white man, and that at various places in the Southwest extensive irrigation works were built by these early people and water from the river and its tributaries was used for the growing of crops.



Hoover Dam, forming Lake Mead which extends 115 miles upstream to lower reaches of the Grand Canyon of the Colorado River.

Prior to the completion of Hoover Dam in 1935, the Colorado for countless centuries had been roaring down the mountain canyons and desert plateaus of the Southwest—a mad water giant that destroyed with its annual floods all of man's work that chanced to be in its shifting path. It is extremely variable in the quantity of water it carries, and before Hoover Dam was built its flow in the lower river varied from floods running as high as 200,000 cubic feet per second to a mere trickle in the late summer and fall.

After the disastrous floods of 1905 and 1906 that inundated a large part of Imperial Valley and formed the Salton Sea, the Federal Government began to give its attention to the problem of controlling and conserving the flood waters of the Colorado. These studies resulted in the adoption by Congress in 1928 of the Boulder Canyon Project Act authorizing the construction of Hoover Dam.

The Government's investment in Hoover Dam and power plant is being repaid, with interest, by the people of Southern California who obtain water and power from the river.



1947

Threat to Water Supply

Calls For United, Aggressive Community Action

San Diego and the six other agencies comprising the San Diego County Water Authority are now members of the great family of communities united in The Metropolitan Water District of Southern California. Thus there is presented the strongest possible front in meeting the mutual problem of protecting the entire area's vital stake in the Colorado River.

This problem is one demanding concerted action and utmost vigilance; otherwise, the long, costly struggle to assure a sufficiency of precious—even priceless—water will fall short of the objective to which the economic life of an industrial and agricultural empire is geared.

The Colorado, mighty as is its flow, can meet the accumulating demands upon its volume only at the sacrifice of rights such as those established by the members of the Metropolitan Water District and put to use through vast expenditures for dams, aqueducts, power plants and transmission lines.

San Diego's concern over the crisis developed by the numerous projects designed to tap the Colorado is accentuated by the threat they hold to the supplemental water supply now being delivered through the just completed Aqueduct. The community is reaping the fruits of long-range planning that foresaw the time locally-developed sources would be insufficient to match its growth—the time when it would be necessary to "go to the Colorado."

The civic leadership that looked into the future laid the groundwork for an alert, aggressive campaign that has been climaxed by the delivery of Colorado River water into San Diego County. Pioneering the way was the late Congressman William Kettner, who in 1920 introduced a bill for construction of the All-American Canal and such storage reservoirs



**Ewart W. Goodwin, Chairman
San Diego-Colorado River Association**

and other works as the Secretary of the Interior might find necessary to provide an adequate water supply. While this measure, and a similar one introduced the year before, did not come to a vote, it reflected a community consciousness of the fact that progress and prosperity in the years ahead were dependent upon the remote and as yet unharnessed stream.

Congressman Phil D. Swing, who succeeded Mr. Kettner, teamed up with Sen. Hiram Johnson in 1922 to work for a dam in Boulder Canyon. The next year, the then Mayor John L. Bacon assisted in the formation of the Boulder Dam Association, of which he was chosen president. Pressing for action, Mr. Bacon signed the City's application to the State Division of Water Resources for the right to divert 112,000 acre feet annually from the Colorado for City water supply purposes.

A contract with the Department of the Interior pertaining to administration of water rights for the benefit of "City of San Diego and/or County of San Diego" was signed by the late Mayor John F. Forward and later by Tom Hurley, Chairman of the County Board of Supervisors.



In 1943 the California Legislature approved an enabling act, prepared by Former Congressman Swing and introduced by Sen. Ed Fletcher, setting up the procedure for the organization of county water authorities, and defining the powers of such agencies, and the manner and scope of their operation. The act was signed by Gov. Earl Warren May 17 of that year.

Organization of the San Diego County Water Authority, construction of the Aqueduct by the Navy, and the negotiations leading to the Aqueduct's acquisition by the City and its eventual transfer to the Water Authority, all described elsewhere in this booklet, rounded out the program that for two decades had been keyed to the community's greatest objective—water from the Colorado.

Pending in Congress, or proposed, are scores of projects which if approved would impose demands upon the Colorado that would be possible of fulfillment only by depriving Southern California of a substantial part of its rights. To ward off this threat San Diego County, which would lose a proportionate share of its hard-earned supply, has formed the San Diego-Colorado River Association to help protect the area's equity in the "last water hole of the West."



A. J. Sutherland
Vice-Chairman



Ralph J. Phillips
Secretary

The Association, County-wide in scope, is composed of these members and representatives:

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The Citizens Aqueduct Celebration Committee

With the Cooperation of Agencies and Organizations identified with Water Development in San Diego County:

City of San Diego

County of San Diego

San Diego County Water Authority

San Diego Chamber of Commerce

Eleventh Naval District

San Diego-Colorado River Association

San Diego-California Club

City of Oceanside

Lakeside Irrigation District

City of Chula Vista

City of National City

Fallbrook Public Utility District

La Mesa, Lemon Grove & Spring Valley
Irrigation District

City of El Cajon

Fallbrook Chamber of Commerce

Lakeside Chamber of Commerce

The Metropolitan Water District
of Southern California

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